JPRS-UMA-84-061

24 September 1984

USSR Report

MILITARY AFFAIRS

AVIATION AND COSMONAUTICS

No. 4, April 1984

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

JPRS-UMA-84-061

24 September 1984

USSR REPORT

MILITARY AFFAIRS

AVIATION AND COSMONAUTICS

No 4, April 1984

Except where indicated otherwise in the table of contents the following is a complete translation of the Russian-language monthly journal AVIATSIYA I KOSMONAVTIKA published in Moscow.

CONTENTS

U.S. SPACE WAR INTENTIONS CLAIMED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) pp 3-4

[Article by Col A. Timofeyev: "Whence the Threat to Peace"]

[Text] Cosmonautics Day has become for the people of our country a traditional holiday of peace and labor, constructive development and progress. Yu. A. Gagarin's space flight, just as the launching of the world's first artificial Earth satellite which preceded it, became possible thanks to the fact that a powerful and well organized industry had been created in the Soviet Union through the efforts of the party and people, skilled cadres of workers and technicians, engineers and designers had been developed, and Soviet science, having attained a high level, occupied a leading position in the world in many fields.

It became obvious at the very beginning of the space age that the new technology was capable of efficiently and effectively performing not only scientific and economic tasks but military missions as well. Proceeding from this, the Soviet Union, faithful to its foreign-policy principles -- a struggle against the threat of war and to hold the arms race in check -- since 1958 has been persistently and consistently pursuing a course of policy aimed at peaceful utilization of space. Our country pioneered international cooperation in this domain and was the initiator of all agreements currently in force. This journal has discussed on numerous occasions those things which have been accomplished in this area.

In the current tense, complex international situation, the USSR remains true to its peace-seeking policy. "This Leninist policy of peace, the fundamental features of which at the contemporary historical stage have been defined by decisions of the most recent CPSU Congresses, is in conformity with the root interests of the Soviet people, and essentially in conformity with those of the other peoples of the world as well. And we resolutely state: we shall not retreat a single step from this policy," stressed CPSU CC General Secretary Comrade K. U. Chernenko at the special February (1984) CPSU CC Plenum.

The Soviet leadership has repeatedly warned the United States at the very highest level that resolving the problem of preventing an arms race in space should not be postponed. Otherwise mankind will be faced with a new threat,

the scale of which can scarcely even be imagined at the present time. New weapons systems being developed in the United States make such a prospect a real possibility. The Soviet Union has advanced specific proposals on how to eliimnate the threat of employment of force from space and in space, and it calls upon the United States to begin talks on this matter without delay.

An interesting pattern has been noted with the passage of time: the greater the initiative with which the Soviet Union presents peaceful proposals dealing with space, the colder is the American response to these proposals. In addition, the further the historic launching of the first artificial Earth satellite and the first manned space flight recede into the past, the thicker the clouds of war in space and from space become. What is the reason for this?

Washington sees the alleged "Soviet military superiority in space" as the reason for this. The lying deceitfulness of the propaganda expatiations of the U.S. politicians becomes quite obvious if one merely looks at history. Immediately following the launching of the first artificial Earth satellite, the United States commenced talk about a "Soviet military threat in space." Arguments to this effect began appearing with increasing frequency following the flight of Yu. A. Gagarin. Time has been the judge of the validity of these arguments. We were witnesses to a situation where the United States, exploiting the propagandist hue and cry, itself commenced militarization of space. They built antisatellite systems one after the other, first on Kwajalein Island in 1963, and later on Johnston Atoll in 1964. Why did they do this?

An answer to this and the previously stated question is provided by MSU N. V. Ogarkov, chief of the General Staff of the USSR Armed Forces: "Expatiating about their alleged devotion to peace, the U. S. Administration blasphemously declares through the lips of its secretary of defense that "the road to peace is marked by preparations for war." Just how far the U.S. "hawks" have gone is attested by a "defense directive for fiscal years 1984-1988" drawn up at the request of the U.S. President. The "destruction of socialism as a sociopolitical system" is stated as the principal aim in this official document. The objectives and means of its implementation are clear.

An arrogant dream -- to gain hegemony on Earth through domination in space -- arouses the passions of the U.S. imperialists and incites them to engage in risky ventures. In recent years the United States has been counting on another "decisive advance," this time in technology, but with the same goal in mind: to pack space with new weapons. This tendency has become even more pronounced since the present U.S. Administration has come into office.

At the very outset the Reagan Administration accomplished that which can be characterized as nothing other than militarization of NASA: it shook up the leadership of this agency and turned it into an appendage of the Pentagon. The vice president of General Dynamics -- one of the biggest contractors for the U.S. Department of Defense -- was appointed director of NASA, and a former secretary of the Air Force was named his deputy. Maj Gen J. Abrahamson is in charge of the NASA Space Shuttle Program. Many Air Force officers have been transferred to this organization's Washington headquarters, and hundreds of

Air Force civilian personnel have been assigned to NASA space centers (California, Texas, Florida). At White House initiative appropriations for military space programs have increased sharply and in rate of growth continue to lead all other military expenditure items. Including that part of the NASA budget earmarked for supporting military activities, they exceeded 14 billion dollars in fiscal year 1983.

Liberal infusions of billions of dollars are redoubling the energies and kindling the imagination of the strategists across the sea. "Space is one of the areas in which we should proceed aggressively," the Pentagon chief tirelessly repeats in a commanding tone. "We shall now seriously proceed to utilize those possibilities which space offers to us," he is seconded by the Department of the Air Force deputy for strategic and space systems.

Of course not only the future is being discussed in this "hawkish" exchange. A present, current mission of the U.S. Air Force is the testing and deployment of a new antisatellite weapon, known as the "small air-launched system" (a specially modified F-15 fighter carrying an ASAT antisatellite missile). A U.S. secretary of defense directive calls for it to be operational within the next few years.

The first firing of an ASAT missile to a designated target point in space was performed in January 1984. The foreign press has reported that commencement of flight tests of this system against actual targets is also scheduled for this year. Target satellites will be launched from the Air Force's Western Space and Missile Test Center at Vandenberg Air Force Base, while the ASAT-carrying aircraft will operate out of Edwards Air Force Base (California). Operational deployment of the system is scheduled in 1987. Two squadrons of fighters armed with antisatellite missiles (36 aircraft) will be stationed at Langley Air Force Base (Virginia) and McChord Air Force Base (in Washington State). Their deployment locations were selected taking into consideration possible angles of inclination of the orbits of Soviet space vehicles.

Development of another space weapon system, a component element of which is also an aircraft, is proceeding at an accelerated pace. The U.S. companies Boeing and Pratt & Whitney, under contract with the U.S. Air Force, have designed a reusable combat mini-spacecraft, which will be launched by a Boeing 747 transport. As the press reports, such a mini-shuttle will require not more than 100 minutes to reach a target located above any point on Earth.

It is planned to make the first models of these shuttle craft pilotless. Their purpose is a closely-guarded secret. The West German magazine FLUG REVUE, however, is unlikely to be far from the truth in asserting that "every future flight by such a craft can be called a death-dealing mission."

Steadily increasing importance is being attached to the development of directed-energy (beam) weapons. Legislation passed by the Senate requires "demonstration of a laser weapon in orbit within this decade." The principal missions to be assigned to such a weapon would be to destroy hardware in space and the adversary's ballistic missiles during launch. In contravention of the ABM Treaty, the United States has gone ahead with the decision to employ new-generation weapons as antimissile weapons. This was announced in a speech by

President Reagan on 23 March 1983, dubbed his "Star Wars" speech. It is true that the President made only vague reference to such weapons. Clarification was given, however, in statements by prominent members of the administration and scientists close to the administration made subsequent to this address. What we are dealing with here is employment of various types of beamed-energy weapons deployed in near-earth space (complete weapons or weapon components).

A considerable role in U.S. war plans is assigned to the reusable Space Shuttle craft, from which the appearance of any scientific function has long since been stripped and which have been "inducted" into military service. President Reagan's national space policy directive states in plain terms that priority in Space Shuttle missions will go to military requirements. It is planned to put military satellites, Pentagon orbital command posts, manned space station modules, and many types of space weapons into orbit with the assistance of the Space Shuttle craft. The fact is that all the most important military space projects are linked to the Space Shuttle.

The Pentagon figures that Space Shuttle craft "should increase U.S. capability to put weapons into orbit," and the military is endeavoring to take over full control of the Shuttle Program. Another indication of this is the priority-basis, rush construction of a military space launch center at Vandenberg Air Force Base in California, from which Space Shuttles carrying exclusively military "payloads" will be launched beginning in 1985.

The feverish pace being set by the United States in the space arms race can also be graphically traced in the organizational structure of those agencies the direct function of which is to engage in preparations for war in space. This structure is constantly being refined. A special U.S. Air Force Space Command, with headquarters at Colorado Springs, Colorado, was established on 1 September 1982. Space operations committees, a space technology center, and an interagency coordination group on problems of space policy have been established at the Pentagon and in the Department of the Air Force. A Space Defense Operations Center has been established at the underground NORAD (North American Air Defense system) command complex.

A year passed, and the appetite of the "space strategists" grew larger. In November 1983 the Joint Chiefs of Staff recommended that the Air Force, Navy, Army, and Marine Corps establish a joint command to direct all military activities in space. Such a reorganization was dictated by the adventuristic idea of attaining military superiority over the USSR and by aspirations to obtain the opportunity to hold the entire world in "space" gunsights.

The above-mentined presidential directive on U.S. national space policy (announced in July 1982), which is filled with imperial pretensions to a U.S. lead role in space and direct utilization of space solely for narrowly selfish U.S. interests, and directly focusing the Pentagon toward preparations for war in space, contains equally dangerous and equally hopeless aims.

These are the facts. They clearly show whence arises the threat to world peace, who is the initiator in the space arms race, and who is impeding the adoption of measures which would place an obstacle in the path of militarization of space.

"We clearly see the threat which is being created today for mankind by the reckless, adventuristic actions by the aggressive forces of imperialism, and we are speaking loudly about this, directing the attention of the peoples of the entire world toward this danger," stated CPSU CC General Secretary Comrade K. U. Chernenko in his speech at the special CPSU Central Committee Plenum held in February of this year. "We have no need for military superiority, and we have no intentions of dictating our will on others, but we will not permit the attained military balance to be disrupted. And let nobody entertain the slightest doubt: we shall continue in the future taking pains to strengthen our country's defense capability, to ensure that we have adequate means with the aid of which we can cool the ardor of the militant hothead adventurists."

The sharp aggravation of the international situation is imposing higher demands on the level of combat readiness of the Soviet Air Forces. Success in air combat will depend on the weapon and tactical proficiency of flight personnel, the degree to which they master their weapons and aircraft, and excellent moral-psychological qualities. Particular attention should be focused on mastering modern equipment and weapons and to how the slogan "New equipment -- a higher level of mastering it!" is implemented. The campaign to achieve new levels of combat expertise is inseparably linked with the further development of socialist competition under the slogan "Be alert, constantly ready to defend the achievements of socialism!"

It is the sacred duty of military aviators to work persistently to achieve further increase in their combat proficiency and to strengthen discipline and combat readiness, guaranteeing an immediate repulse to any aggressor. "Strengthening defense capability," stated USSR Minister of Defense MSU D. F. Ustinov, "is a guarantee of the reliable security of the Soviet State and the other nations of the socialist community. It objectively serves the cause of preserving world peace. The Communist Party and the Soviet people are doing and will continue to do everything to ensure that the defense might of our homeland and the combat readiness of the Armed Forces remain at a high level. U.S. intentions to achieve military superiority over the USSR are in vain. The USSR will never permit this. It will never find itself weaponless in the face of any threat."

3024
CSO: 9144/347

HELICOPTER GUNSHIPS ATTACK TANKS FROM AMBUSH

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) p 5

[Article, published under the heading "Be Alert, in a Continuous State of Combat Readiness," by Maj V. Sekhin: "Attack From Ambush"]

> [Text] "Captain Anatoliy Mikhaylovich Koryak shall be awarded the Order of the Red Star for exemplary performance of duty and mastery of complex military aircraft equipment...."
>
> From an ukase of the Presidium of the USSR Supreme Soviet

The tactical air exercise was entering the concluding phase. The motorized riflemen, having broken through a strong "aggressor" defense with tank support, were endeavoring to consolidate their position. But the "aggressor," moving up reserves, was readying for a counterattack. A tank column was advancing in a narrow spearhead from deep in the "aggressor's" defenses with the intention of splitting the advancing force in two.

The commander of the motorized rifle battalion and the commander of a helicopter squadron were bent over a large-scale map.

"As I see it," the squadron commander said, "we shall give you supporting fire from the air at two points. Following artillery preparation, a strike group will separate the infantry from the tank column. Helicopter ambushes are deployed on the likely avenues of approach. The primary and alternate landing sites are here. Captain Koryak has been designated group leader. As arranged in advance, a forward controller will be positioned in this grid square." He made a pencil mark between the saddles of two hills. "The 'aggressor' could counterattack from here, according to intelligence provided by ground and air reconnaissance."

After conferring with his executive officer and the commanders of the supporting tank and artillery subunits, the battalion commander gave his approval to this plan.

of smoke from shellbursts could be seen. The attack group helicopter gunships were readying to take off from the airfield. Under covering smoke screens,

Capt A. Koryak's section was to proceed to the ambush site undetected and be ready to hit the tanks with a surprise attack.

Darkness fell. Soon the shadows erupted with the brilliant bouquets of artillery shellbursts and rockets fired by the attack group's helicopter gunships. Capt Anatoliy Koryak's men were performing with precision -- Sr Lt Vladimir Polyankin, commander of the best crew in the Red-Banner Helicopter Regiment imeni V. I. Lenin, and weapons officer Sr Lt Aleksandr Musorov. The captain was counting as much on them as he was on himself. Later the range flight operations officer reported that all rockets had precisely impacted the target.

In the meantime the crews of the helicopters tasked with mounting the ambush attack were waiting for the go command on sites ringed by heavy Far Eastern taiga forest growth. They were prepared to take off at an instant's notice and shatter the counterattacking force with a surprise attack.

Captain Koryak, together with weapons officer Sr Lt Viktor Orekhov and flight technician Sr Lt Tech Serv Aleksandr Batovskiy, once again checked systems and weapons, and refined the calculated figures to the reference points indicated by the forward controller. They still had time. Anatoliy suddenly remembered that he had not yet read the letter he had received from his brother Vasiliy, who was also a helicopter pilot....

Poltava agronomist Mariya Ivanovna and Sel'khoztekhnika mechanic Mikhail Iosifovich Koryak had never imagined that their sons, one year apart in age, would become pilots. They had wanted both to become agronomists. Anatoliy had even enrolled at an agricultural secondary technical school, but he abandoned his studies when his younger brother finished school. "I just wasn't cut out to be an agronomist," he said, "although I love the land. The more strongly a person is bound to the land, the stronger he is."

The brothers succeeded in enrolling at a military higher aviation school on the first try. Anatoliy graduated with a gold medal. His first duty assignment was to a famed helicopter regiment, under the command of officer V. Archegov.

Lt A. Koryak quickly and thoroughly mastered the helicopter gunship. They had a young crew. The officer still remembers the first rocket firings. They were nervous, but they accomplished the mission with a mark of excellent. They put all rockets "onto the peg," as they say.

Some people believe that a pilot's finest qualities are revealed in emergency situations.

"It seems to me," says Anatoliy Mikhaylovich, "that a knowledgeable pilot rarely encounters emergency situations, but he is always prepared for them."

Well put! It is for good reason that they say: "If you take off on a flight as if on a major exploit, you are not ready for it." The flying profession is romantic, but it contains a great deal of plain hard work! This is one of the reasons why Koryak prepares for every training sortie just as hard as for his

first one. His subordinates and fellow soldiers marvel at his industriousness, his meticulousness, and his ability independently to arrive at the truth. His colleagues make the following comment: "An excellent pilot. An expert at combat. An exemplary commander. A person on whom one can count at all times and in all situations."

Captain Koryak has boundless affection for his profession. He has logged hundreds of hours. Of course that is not a great deal if one judges by a ground measuring stick. But logged flight time in combination with combat actions is extremely difficult work, sometimes involving risk as well.

"Battle" erupted. The forward controller came on the air and indicated the grid squares in which the "aggressor" tank column was deployed.

The section commander glanced at his luminous watch dial. It was time. The fire support helicopters lifted off almost simultaneously from the four locations. Military Pilot 1st Class Captain Koryak led his group along a creek valley, hugging the treetops. He decided to fire the antitank guided missiles at maximum range in order to avoid getting too close to the "aggressor" air defense, for the latter had most probably set up antiaircraft weapons in his reserves deployment area. Reaching the base reference point, the helicopters formed into an echelon. The antitank missiles surged from their launcher tubes almost simultaneously. The armored vehicle mock-ups blazed into flame. Breakoff, and within minutes landing at the alternate site.

Later the section commander received praise from the flight operations officer: "Outstanding, you did a fine job!"

This was one of the mock engagements fought by the section led by Capt A. Koryak, a first-class military pilot and holder of the Order of the Red Star. And every one of these engagements is the most difficult.

3024
CSO: 9144/347

IMPORTANCE OF IDEOLOGICAL INDOCTRINATION AT PILOT SCHOOL STRESSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) pp 6-7

[Article, published under the heading "A Higher Level of Party Influence at Air Forces Higher Educational Institutions," by Col P. Zolotarenko, political section chief, Syzran Higher Military Aviation School for Pilots imeni 60th Anniversary of the USSR: "A Fighting Man's Strength Lies in Moral Fiber"]

[Text] An article by Col Gen Avn L. Batekhin (AVIATSIYA I KOSMONAVTIKA, No 3, 1984), military council member and chief of the Air Forces Political Directorate, raises important questions, in a timely manner and with sharp party focus, pertaining to further enhancing the role of political agencies and party organizations at Air Forces higher educational institutions and their influence on all aspects of life and activities at these institutions. They include the question of improving ideological-political indoctrination of future officers at our flight schools. This impelled me to take up my pen and share our experience on the pages of this journal. I would like my colleagues to continue the discussion which has begun, to examine the problem from a party position, and to tell us about their successes as well as about unimplemented reserve potential and capabilities.

I shall frankly admit that there was a time when commanders, political workers, party and Komsomol activists at our higher educational institutions for training pilots were satisfied with the attained level of ideological and mass political work being conducted and devoted insufficient attention to work involving selection of the most worthy pilot cadets for CPSU membership and improving the indoctrination of young Communists. These issues did not arouse particular concern on anybody's part. Practical realities, however, and the demands proceeding from the complex international situation brought significant adjustments to the diversified activities of our political agency pertaining to guidance of party and Komsomol organizations in the matter of indoctrinating future pilots as ideological warriors of the party and active implementers of its policies.

Following the June and December (1983) CPSU Central Committee Plenums, we took a new look, as it were, at the important tasks assigned to our school, in particular such tasks as achieving further growth of party influence on the entire course of the training and indoctrination process with the aim of

training courageous, ideologically conditioned defenders of our country's air space who are totally dedicated to the party and Soviet people.

Soviet aviation personnel are highly respected by the people. The illustrious deeds accomplished by our pilots in combat against the enemies of our homeland, as well as during peacetime, stir the emotions and arouse feelings of great love and respect. It is the strong desire to stand in the front ranks of the builders of communism and to build upon the fine revolutionary and fighting traditions through their military labor that brings young people to higher aviation schools for pilots, including our Syzran Higher Military Aviation School for Pilots imeni 60th Anniversary of the USSR. Young men earn their wings here, in the skies over the Volga. From here they fly off to various parts of our vast socialist homeland, to serve it faithfully. We are justly proud of our graduates. Many of them have been awarded combat decorations, and V. Gaynutdinov, V. Shcherbakov, Ye. Zel'nyakov, and V. Pavlov earned the title Hero of the Soviet Union. While enrolled at the school these combat pilots received solid ideological-political conditioning and became convinced bearers of Communist ideals. We feel that perhaps their most important distinctive feature is a high degree of party and professional discipline.

However, proceeding from the intensifying ideological antagonism between the two socially opposing systems at the present stage, we realize that it is essential to continue in the future stepping up efforts in the area of indoctrinating young pilots in a spirit of strong Communist awareness, moral fiber, and profound faith in the triumph of Communist ideals.

Our Communists, political section officers, and instructors in the Department of Marxism-Leninism are inspired by the concern on the part of the party Central Committee with issues pertaining to further improving mass-political and ideological work among Soviet citizens, particularly youth. Appropriate measures were taken to ensure that all teaching faculty without exception, all pilot-instructors, as well as leaders of cadet subunits approach this important problem with an equally clear understanding of their responsibility. Coordination in their teaching activities, a higher degree of party-mindedness in teaching and indoctrination, and clarity of ideological argumentation in the course of theoretical and special training classes -- all this has become an important and timely response to the decisions of the June CPSU Central Committee Plenum.

The first organizational measures on these items were determined by a joint session of the school political section and department of Marxism-Leninism, with the participation of the secretaries of the party organizations of the flight training section (ULO) and the training subunits. Party members V. Bondarenko, Yu. Sychev, N. Radchenko, N. Lipchinskiy, and others made practical, comprehensive suggestions at the meeting, connected with a combined approach in ideological work. There sounded in their comments a note of dissatisfaction with the performance of certain teaching faculty and pilot-instructors. The task consisted in comprehensively arming these two main teaching and indoctrination categories of personnel with methodology of cadet ideological training. The main emphasis was placed on ensuring that this work became an organic part of the process of training and indoctrination.

We must note for the sake of fairness that positive results from the common efforts on the part of commanders, political workers, party and Komsomol activists are already in evidence. They are reflected first and foremost in the fact that the cadets are showing interest in mastering the forms and methods of party-political work. They willingly take part in the activities of the Znaniye Society under the auspices of the city party committee and in the activities of the military scientific society in the department of Marxism-Leninism.

The practice of electing deputy secretaries and secretaries of young Communists in the company Komsomol organizations has proven effective. The political section continuously monitors the level of ideological training of those cadets who lead teaching detachments in the city general-curriculum schools. We enlist a total of about 50 percent of future combat pilots to active participation in sociopolitical, indoctrination and ideolgoical work, hoping that one out of every five or six of our graduates will in the near future become a squadron or independent detachment political worker. We have had experience in this regard. Officers V. Kopchikov, A. Shakhunov, N. Bezborodov, Yu. Vladykin and other of our former cadets have become political workers.

Naturally our efforts to train young pilots as comprehensively developed party ideological warriors are directed not only toward this category of cadets but also toward all personnel of the cadet subunits. Therefore, in devising various methodological devices in the department of Marxism-Leninism and furnishing them to the political workers of the training regiment and squadrons, the political section officers seek to maintain constant contact between this department and the other ULO departments, assigning to them the best social sciences instructors. These instructors, together with the department party organization secretaries, give specific help to each and every member of the teaching faculty in ensuring a high degree of party-mindedness in their teaching. I shall cite an example in support of this statement. Instructors in the department of aerodynamics, who in the past had been criticized, have substantially revised their views, thanks to assistance by young scientist Lt Col Yu. Onushkin, on methods of conducting classes and have begun preparing for their lectures better and more comprehensively.

I shall note that following the June and December (1983) CPSU Central Committee Plenums and our party's special Central Committee plenum held in February of this year, all instructors in the department of Marxism-Leninism have not only substantially added to their lectures a wealth of profound-content material on ideological issues but have also helped their colleagues in the other departments reorganize certain forms of indoctrination work with the cadets both during regular school hours and on an extracurricular basis. In addition the officers of the political section and Communists from the department of Marxism-Leninism often visit the barracks and airfields. Talks in the flights and personal assignments to the pilot cadets pertaining to organizing party-political work help them better assimilate many points of ideology and theory.

Work is not limited to this. Acting through the party organization of the flight training section, the political section has focused teaching faculty on giving specific assistance to pilot-instructors in their political indoctrination work with the cadets. Quite frankly, this aspect of things still requires constant attention, and here is why.

The majority of the pilot-instructors lack adequate experience in working with pilot cadets and do not always take into consideration a diversity of forms and methods of their ideological-political indoctrination. This was emphasized at recent party report-election meetings. Party members of the training helicopter squadrons, self-critically appraising their participation in ideological work, presented practical suggestions. Section party organization secretary Sr Lt V. Grigor'yev, for example, suggested synthesizing the experience of the best pilot-instructors in political indoctrination work with pilot cadets and suggested that it be discussed at a methods conference. Implementing the adopted decision, a combined team headed by leader-party member officer V. Resnyanskiy studied in detail the work performance of the vanguard pilot-instructors in the subunits and thoroughly analyzed their experience. Taking this analysis into consideration, the school command authorities and the political section held a methods conference on political and military indoctrination of pilot cadets and on developing command qualities in them.

Party and Komsomol activists took part in preparing for this conference, and the conference recommendations were discussed at a meeting of the school council, which examined progress in implementing the CPSU Central Committee and USSR Council of Ministers decree entitled "On Further Development of the Higher School and Improving the Quality of Training Specialists."

We consider thorough and comprehensive study of the principles of the party leadership, standards of party behavior, and the profoundly scientific activities of the CPSU both on domestic and international problems to be one of the main areas of Communist indoctrination of future pilot-engineers. This develops in future officers respect for all forms of party work, helps them develop a Leninist work style, and fosters higher-quality selection into party ranks of the very finest of the best representatives of aviator youth.

In the department of Marxism-Leninism, the principal constituent element in the ideological-political indoctrination of cadets, training of young people as party political warriors is carried out continuously in the course of study. Officers I. Kazhev, A. Morozov, and A. Kuznetsov, who teach history of the CPSU, skillfully illustrate the party's titanic activities with specific examples from the life of Marxist-Leninists and tell about their knowledge of philosophy and economics self-education and contribution to scientific communism. Instructors officers L. Kharchenko and B. Krasnov are also proceeding correctly, we feel, when they instill in the cadets a taste for the practical forms of party-political work with the assistance of political workers, party and Komsomol activists during study of party-political work.

High-quality selection of cadets for party membership and indoctrination of young Communists has been and continues to be an important item. A great deal depends on recommending personnel in its successful accomplishment. In the

past it has sometimes happened that leader-Communists would display passivity, or would even not take part in selecting worthy cadets for party membership. It would sometimes happen that certain instructors would give party recommendations to several cadets at the same time, and as a rule to those who requested it. And yet they should have waited before ushering some of them into party ranks. Party members discussed these shortcomings at recent seminars for secretaries of party and Komsomol organizations, as well as at party member meetings. They decided that a Komsomol organization which has recommended its members for CPSU membership should at least once every 3 months analyze their progress in probationary status, hold individual interviews, while Communists who have given recommendations to cadets should prepare them for joining the party.

The quality of preparation for and conduct of party meetings in the flights and squadrons is exceptionally important. At these meetings young party member cadets closely encounter implementation of the CPSU rules and learn how acquired knowledge can be more effectively implemented in an aviation subunit. The party members of the flight commanded by Maj A. Dobryakov, for example, succeeded in making a lagging class squad into a vanguard performer by ensuring personal exemplariness on the part of young party member cadets. Meetings crown practical party work, and party members ensure rigorous conformity between word and deed.

The content of officer Marxist-Leninist training is also focused on improving ideological-political indoctrination of cadets. Recently a scientific and practical conference was held in all groups at the school, on the topic "On Work Forms With School Officer Personnel, Pilot-Instructors and Teaching Faculty in Indoctrinating Future Pilot-Engineers as CPSU Political Warriors." The party committees and buros organized this conference. Participants included veterans of the party and the Armed Forces as well as party officials from the city CPSU Committee.

Thus we not only develop in cadets dedication to the cause of building and defending communism but also seek to ensure that they have the ability to assess sociopolitical events independently, function as propagandists of Communist ideas, and actively transform them into practical actions.

3024
CSO: 9144/347

IMPORTANCE OF PRACTICING NAP-OF-THE-EARTH FLIGHT MAINTAINED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) pp 8-9

[Article, published under the heading "Be Alert, In a Continuous State of Combat Readiness," by Military Pilot 1st Class Maj A. Zhestkin: "From Close to the Ground"]

[Text] The degree of skill with which a combat pilot flies in close proximity to the ground determines in large measure accuracy of reconnaissance, arrival over target on schedule, and flight safety. For this reason commanders devote close attention to teaching pilots low-level flying.

As we know, low-level flight possesses not only important tactical advantages but also negative aspects as well. For example, due to the high speed and limited angle of view, visual coverage of the terrain becomes appreciably narrowed, which complicates orientation, verification of track, and heightens psychophysiological and emotional stresses. In addition, during multiple-aircraft flights the leader's actions are appreciably restricted, since turns are executed at a much shallower bank angle than during single-aircraft flying. And what happens if the situation becomes complicated and it becomes necessary to complete a turn on the wingman? Of course they can change formation, but will there always be enough time? It can be done with a two-ship formation, but what about in a flight of 3 or 4 aircraft?

It is an indisputable fact that any flight close to the ground, especially a multiple-aircraft flight, should be preceded by thorough, comprehensive preparation, prescribing expert precision group flying technique and the ability of the pilots to have a perfect understanding of one another, for low-level flight places heavy demands on a combat pilot, which must be taken into account. But no matter how well a pilot has prepared on the ground, he will be unable to fly a combat aircraft with confidence at extremely low level if he does not reinforce his acquired skills in actual flights.

Unfortunately it sometimes happens that certain commanders, pointing to the need to observe safety precautions, play it too safe, and the pilots, having flown a standard, very familiar route with plenty of terrain clearance, enter in their log an extremely low-level flight, while in their recon reports they indicate objects which they did not adequately observe. And they long

remember missions once performed at an exercise in a complex situation, following independently calculated routes, with a variable flight configuration.

A situation in which compromises with realism are reduced to a minimum fosters innovative development of a given variation and generates the endeavor constantly to improve one's professional competence. Pilots have even failed to feel tiredness after flying in conditions maximally approximating actual combat. They would be pleased that the training sortie had not been in vain, that they had acquired experience. They knew that if it should become necessary, they would be able to carry out such a mission in actual combat conditions as well. It seems to me that restrictions imposed allegedly for the sake of observing safety procedures are harmful, since they diminish the tactical and performance capabilities of a combat aircraft and at the same time the pilot's capabilities as well. Flight safety is achieved not by restrictions but by thorough training and preparation and by improving one's level of professional skill. Here is an example.

At a certain exercise the group led by 1st-Class Pilot Lt Col Ye. Sivorakshin was assigned the mission of spotting a target on an unfamiliar range and destroying it. There was little time remaining to prepare for the mission, but the leader organized things in such a manner that each pilot was able to prepare quickly and fully for flying the mission. They began with assessing the "aggressor's" air defense, choosing a route, and determining a flight configuration guaranteeing concealment and the element of surprise in approaching the target. The range was situated at a distance exceeding the tactical radius of the group's aircraft, and therefore it was decided to land at an en-route airfield after completing the mission.

The route was plotted out on the map. The sea was to the right, with marshes to the left. They were unlikely to encounter air defense weapons. And although frequent route zigs and zags lengthened the distance to be covered, it ensured the main objective -- an undetected flight.

Finally the combat aircraft were in the air. Variegated terrain swept under their wings. At the designated point the aircraft pairs descended to terrain-hugging height. It became much more difficult to orient themselves, but they managed thanks to detailed study of the terrain when preparing for the mission. Lieutenant Colonel Sivorakshin monitored the precision of the flight from recognizable stream bends, tracts of forest, and lakes. The pilots were strictly maintaining the designated height above ground. The scheme which had been formulated on the ground proved correct. In spite of heavy defense of the range by air defense weapons, the group found a gap in the "aggressor's" radar coverage and was finally detected a few seconds prior to the attack. These few seconds were enough for the pilots to identify the target, deliver a lightning-swift attack, and fly clear of the air defense weapons.

They landed at the alternate field. The situation could change at any moment, requiring an immediate takeoff, and therefore the pilots themselves preflighted their aircraft, refueled them, and checked their instrumentation setup. When the transport aircraft carrying the ground crews landed at the field, all operations were completed. All that remained for the ground

crews was to check to make sure the pilots had performed the procedures correctly. Some time later the combat aircraft were again in the air. The group also successfully accomplished the newly-assigned mission.

Unquestionably the pilots' success was ensured in large measure by correct organizational work by the group commander. Thoroughly familiar with his men's level of proficiency and their exceptional conscientiousness, Lieutenant Colonel Sivorakshin gave them the opportunity to display innovativeness in choosing a flight configuration and maneuver after spotting the target. Realizing that they should perform the mission without unnecessary situation simplifications, the pilots devised a strike variant which would be possible in actual combat conditions. These training missions gave the men confidence in their ability.

Here is a different sort of example. Sr Lt S. Ul'yanov is currently considered one of the unit's best pilots. He displays a high degree of combat aggressiveness, initiative, and independence in making decisions when time is of the essence. Formerly, however, when flying an extremely low-level sortie, he would sometimes drift upward: his nerves couldn't take it. He often failed to recognize a selected en-route reference point for precisely hitting the maneuver commencement point and initiating a target pass. But every time an aircraft rises above ground-hugging height, the pilot is inviting an "aggressor" radar fix and is doing a poor job of carrying out the training sortie.

The flight commander explained to the pilot that precisely maintaining flight altitude and reaching the target with precision are not whims on the part of one's superiors but rather harsh necessity, dictated by the severe demands of modern combat. But at first Ul'yanov failed to attach importance to this. As he saw it, it was no big thing to be a bit late reaching the target or to deviate slightly off one's route. The main thing was to find the target, after which one could become oriented. In time, however, he became convinced that his instructor had been right, realizing that inaccuracy and lack of precision means that an attacking aircraft spends unnecessary time within effective range of hostile air defense weapons. In mock combat this does not result in aircraft losses, but what about in actual battle? He grasped the point, but at first things did not improve.

"What is the reason for the unsuccessful performances of a pilot who is basically pretty capable?" the flight commander pondered. "Am I perhaps holding the reins a bit too tight? After all, we do absolutely everything together. Perhaps this has been a hindrance to him?" From that moment on he altered his training method. He began giving Ul'yanov assignments to work things out for himself and became convinced that he had found the correct solution. At first the pilot would sometimes come to him with various questions. The commander would answer them and at the same time would courteously suggest how he could find the correct answer for himself. Gradually Ul'yanov began "moving out" from under his wing. In working up a route, he would concomitantly study the area of the forthcoming flight, as well as the situation. The pilot gained faith in himself and in the fact that he was capable of independently accomplishing a task in excellent fashion. And things proceeded to improve.

Taking part in the "Soyuz-83" [Alliance-83] exercise (it was his first exercise), Ul'yanov displayed enviable persistence and excellent moral-psychological qualities. He accomplished all assigned missions with excellent results.

Analyzing the above examples, one can reach the following conclusion: one should take the factor of individual personality into account during individual and group training and preparation for extremely low-level flying. How a given pilot performs a mission flying alone is one thing, and how pilots perform together is a quite different thing. In addition, mission execution will always be positive if people have become accustomed to think in an unstereotyped and innovative manner.

At the present stage, when air defense weaponry is continuously evolving and improving, extremely low-level flight helps accomplish only certain missions. And no matter how closely a pilot "hugs" the ground, nevertheless he is not guaranteed against attack. In connection with this, pilots devote considerable attention to rehearsing actions in an antiaircraft missile zone and to choosing a target breakoff and departure maneuver. In my opinion it would be appropriate periodically to hold training courses and competitions at which senior officers and experts could objectively assess the effectiveness of devised techniques and give advice on improving them.

Once the flight commanded by Capt P. Lubskiy was to knock out a target strongly defended by air defense weapons. The standard flight configuration for such a mission called for the attacking group to open up with a sequential turn to the left. The flight commander decided to proceed differently. He worked out his own variation, discussed it with the pilots, and made the necessary calculations. After "walking it through," they all were convinced that the proposed technique was much more effective than the previously-rehearsed one. The squadron commander, examining this variation, made certain corrections and supported the flight commander's proposed course of action.

Some time later the crews were airborne. Precisely following the designated route, they reached the maneuver commencement point at extremely low level. Climbing steeply to the designated height, the aircraft pairs attacked from out of the sun. They achieved the element of surprise. They subsequently attacked from various directions. In this manner the target was under continuous delivery of fire. The mission was accomplished.

There are many specific peculiarities involved in mastering low-level flying, and each one must be borne in mind. One thing is sure: expertise takes time to acquire. Gradually young pilots master this aspect of training, and strictness of performance evaluation helps them in their further advance toward the designated combat performance levels. A striving to grasp the unknown and the element of competition in flight activities mobilizes aircrews to engage in an innovative search for the most effective means of gaining

victory over the adversary in various conditions, including when flying in close proximity to the ground.

3024
CSO: 9144/347

REVISIONS IN MILITARY OFFENSES LAW OUTLINED

Moscow AVIATISYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) pp 10-11

[Article, published under the heading "Law Indoctrination," by Candidate of Legal Sciences Col Just V. Gushchin, assistant chief military prosecutor: "Strengthen Combat Readiness and Discipline: On Changes in and Additions to the Law on Criminal Liability for Military Offenses"]

[Text] Ukases of the Presidium of the USSR Supreme Soviet, including the Ukase of 15 December, which made certain changes in and additions to the Law on Criminal Liability for Military Offenses, were ratified by the 9th Session of the USSR Supreme Soviet, 10th Convocation, in December 1983. Just what are these changes and additions, and why were they made?

The Law on Criminal Liability for Military Offenses was adopted in 1958. Profound economic and social changes have taken place in our society and in the Soviet Armed Forces since its passage. This evoked the need to update both general and military laws.

A new Law on Universal Military Service Obligation was adotped in 1967, for example, new general military regulations were ratified in 1975 by ukase of the Presidium of the USSR Supreme Soviet, the new USSR Constitution went into effect in 1977, and in 1981 -- the Fundamentals of Legislation of the USSR and Union Republics on Acts Punishable Under Administratiive Law. A new USSR Air Code was ratified in May 1983. Substantial changes have been made in housing, labor, criminal, and other laws. The need also arose for change in and addition to certain articles of the Law on Criminal Liability for Military Offenses and to bring it into conformity with present laws.

The need to refine and change certain provisions of the Law was also dictated by the international situation, which had become sharply aggravated through the fault of aggressive imperialist circles, and by an increase in the danger of war for our country, which requires further increase in the combat readiness of all branches of the Soviet Armed Forces, including the Air Forces, to repel aggression, and strengthening of military discipline and rule of law.

In the new version the provisions of this Law extend to military reservists not only while attending training activities but also during inspection and proficiency testing, which is in conformity with the Law on Universal Military Service Obligation.

Article 7 of this Law has been changed; no longer is there criminal liability involved for verbal insult or nonviolent actions by one serviceman against another. As practical experience has shown, such actions are successfully countered by disciplinary or community-pressure measures. Also eliminated is the element of execution by at least one member of the military of duties pertaining to military service. This will ensure fuller criminal-law protection of the sequence of subordination established in the Armed Forces, as well as the individual serviceman.

Article 8 has been reformulated. The former provision has been replaced by a special provision specifying criminal liability for an offense against regulations regarding relations between military personnel in the absence of a relationship of subordination between them. In the past such violations were specified by general criminal law as hooliganism, although they not only constituted violations of public order but also were in fact directed against regulations pertaining to relations between military personnel and affected their performance of job duties. This gap in the law has now been corrected. For violation of regulations pertaining to mutal relations between military personnel, expressed in assault or other act of violence, the law prescribes as punishment imprisonment for up to 2 years. For assault and battery inflicted on several persons or causing less severe or minor physical injury, the law prescribes as punishment imprisonment for up to 5 years. If such a crime has been committed by a group of persons or with employment of weapons, or if grievous bodily harm has been caused, punishment is increased to up to 12 years in prison.

We must emphasize that from the very first days of existence of the Armed Forces the Communist Party has sought to instill in military personnel an indissoluble military comradeship and brotherhood of arms, which have become a condition, a solid part of the daily lives of army and navy personnel. This unifies the military collective, boosts the fighting efficiency of units and subunits, and constitutes a guarantee of further increasing their combat readiness.

Of course instances of uncomradely interpersonal relations are extremely rare and are uncharacteristic of Air Forces personnel, as is the case for all army and navy personnel. But we cannot be indifferent even toward isolated instancs, because these incidents, just like rust, can eat away military discipline and the strong fabric of military comradeship. And addition to the Law of a new article which specifies liability for violating regulations pertaining to relations between military personnel should help strengthen the campaign against these negative phenomena and help eradicate them.

The present international situation and the increasing complexity of military affairs demands of USSR Armed Forces personnel the highest degree of vigilance, quickness, precision and promptness in performing assigned tasks. Each and every serviceman, in order to meet these requirements, is obligated

to be at his designated station at all times, to be ready at any moment to carry out his duty to defend the socialist homeland. Violations of these requirements cannot be tolerated, since they weaken the fighting efficiency of the subunit and unit. And it is for good reason that all categories of military personnel now bear greater liability for unauthorized absence from one's unit or place of service for more than a month. Formerly imprisonment from 1 to 5 years was prescribed as punishment, while the penalty has been increased to imprisonment for 3 to 7 years. The penalty for unauthorized absence from one's unit for less than 1 month remains unchanged.

Criminal penalties have been established for officers, warrant officers, and extended-service personnel for delay in excess of 10 days in reporting for duty to a new place of assignment without valid reasons and for repeated absence from one's place of duty assignment for more than 72 hours on each occasion in the course of a year's time.

A provision has been added (Article 15) which specifies criminal penalties for violation of proper procedures of handling weapons, substances and objects which present an increased hazard to persons in their vicinity.

Weapons, ammunition, explosives, as well as other substances and objects which require special care and caution in handling, as well as strict observance of instructions and regulations in using, maintaining and transporting them are entrusted to every serviceman in connection with performance of his duties. Violation of these regulations which results in bodily injury shall be punished by imprisonment for a period of up to 3 years. If several persons sustain injury or if a fatality occurs, the penalty is increased to 10 years imprisonment, while violations resulting in the death of several persons or other serious consequences shall be punished by imprisonment for a period of from 3 to 15 years.

The wording of Article 19, which prescribes penalties for violation of garrison and guard duty regulations, has been brought into conformity with current USSR Armed Forces Garrison and Guard Duty Regulations. That part specifying criminal penalties for violation of regulations governing storozhevaya sluzhba [special security service for military administrative and supply installations and facilities; no longer functioning since 1975] has been deleted, since this service category no longer exists.

At the same time the Law prescribes criminal penalties for violation of regulations in any guard detail and at any guard post, regardless of who or what is being guarded. These changes are dictated by the fact that even in peacetime performance of guard duty is legally equivalent to performance of a combat mission, demanding of personnel precise observance of all provisions of military regulations, a high degree of vigilance, and unswerving determination and initiative when guarding any installation.

The wording has been adjusted in Article 21, which specifies criminal penalties for violation of regulations applying to standing alert duty for the purpose of promptly detecting and repelling a sneak armed attack on the Soviet Union or protecting and ensuring the security of the USSR. Imposition of criminal penalties no longer requires the presence of such circumstances,

since success in standing alert duty frequently depends not only on the actions of the duty shift personnel and crews but also on other military personnel designated for performance of this task.

Pilots, engineers, technicians, and specialists of supporting subunits, standing alert duty to guard the homeland's airspace, must be alert at all times, always in a state of combat readiness guaranteeing prompt detection and immediate repulsion of an attack by any aggressor.

Criminal liability for law violations while acting in an official capacity has been formulated and delineated more precisely. Article 24 of the Law -- abuse of authority, exceeding authority, and criminal negligence toward performance of duties -- has been divided into two separate articles, since these crimes differ in degree of danger to society.

Provisions specifying criminal penalties for a negligent attitude by a person in authority or assigned personnel toward performance of duty which has caused substantial harm are now contained within a separate Article 24. In case of commission of such a violation of the law under mitigating or extenuating circumstances, the Law provides for the possibility of applying the provisions of the USSR Armed Forces Disciplinary Regulations.

Only criminal penalties are prescribed for abuse of authority or office by a person in authority or official, for exceeding authority or powers of office, and for nonfeasance in office if such actions occurred on a regular basis or for mercenary motives or other personal gain, and also if such actions have caused substantial harm.

All changes and additions to the Law on Criminal Liability for Military Offenses went into effect on 1 January 1984. They not only increased the legal responsibility of each and every serviceman for performance of job-related duties and performance of the constitutional duty to defend the socialist homeland, but also make it possible more effectively to conduct the campaign to prevent and eliminate military offenses and air mishaps.

Not only commanders and political workers, investigative agencies and military investigators, but all military personnel as well should be thoroughly familiar with the content of these changes and additions, for in order to ensure strict observance of the Law and a thorough awareness of its social justice and the inevitability of punishment for committed law violations, it is necessary to understand the essence and substance of the Law. Toward this end it is essential continuously and purposefully to conduct with all categories of military personnel study of the Law on Criminal Liability for Military Offenses (with the new changes and additions), work which is in progress in every aviation unit and subunit.

It is advisable to utilize all forms and methods of dissemination of legal knowledge at the disposal of commanders and political workers to explain the Law, to raise the status of these efforts to a higher level, to conduct them constantly and purposefully, and extensively to enlist for this purpose party and Komsomol activists, propagandists, agitators, military investigators and people's assessors, as well as military legal specialists.

Thorough familiarity by each and every serviceman with the changes in and additions to the Law on Criminal Liability for Military Offenses should give a new impulse to the socialist competition among military aviation personnel which has developed in the current training year at the initiative of the personnel of the guards fighter regiment under the command of Gds Lt Col Yu. Temnikov, under the slogan "Be Alert, Constantly Ready to Defend the Achievements of Socialism!"

3024
CSO: 9144/347

SOCIALIST COMPETITION PRAISED AS TRAINING AID

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) pp 12-13

[Article, published under the heading "Anticipating the 5th Armed Forces Conference of Komsomol Organization Secretaries," by Maj S. Khor'kov, assistant political section chief for Komsomol work, Air Forces, Group of Soviet Forces in Germany, delegate to the 19th Komsomol Congress: "Competition -- An Innovative Undertaking"]

[Text] Each day of combat training and service duties is presently filled with special content for young aviation personnel of the Group of Soviet Forces in Germany. They consider it their military and Komsomol duty to honor the 5th Armed Forces Conference of Komsomol Organization Secretaries with new successes in increasing combat readiness, ensuring safety of flight operations, and strengthening discipline. Their enthusiasm, productive ardor, activeness, and exemplariness in meeting socialist pledges are manifested in full measure in the campaign for new military achievements.

The materials of the December (1983) party Central Committee Plenum and the special CPSU Central Committee Plenum in February of this year stress that our successes will depend to a decisive degree on mobilization of the masses, on an innovative attitude by people toward the assigned task, and on further development of socialist competition. This point evoked lively response in all our Komsomol organizations. In the regiment in which Sr Lt S. Vyatkin is a member of the Komsomol committee, for example, such fine traditions have become established as strong responsibility on the part of every officer, warrant officer, enlisted man and noncommissioned officer for the success of his unit, friendship and military comradeship, an endeavor to make maximum effective use of time allocated for preparing for flight operations, and excellent quality of execution of combat training missions.

Competition for the privilege of flying a sortie in the place of Hero of the Soviet Union Sr Lt Ye. Krivosheyev, who is permanently entered on the unit rolls, has become quite popular among the young pilots. The winner is determined by the regimental command jointly with the Komsomol committee on the basis of the month's competition results. Following are the basic criteria: level of air proficiency, quality of execution of elements of combat employment, and active participation in volunteer work. The regiment

maintains a mission log in which they enter the sorties flown in place of Hero of the Soviet Union Ye. Krivosheyev.

Recently Sr Lt V. Radin earned this distinct honor. He was one of the first among his comrades to master a combat aircraft which was new for him, and to boost his proficiency rating. This officer enjoys great respect in his outfit, and the Komsomol members elected him secretary of the squadron Komsomol buro. He devotes much attention to explaining the proceedings of the 26th CPSU Congress, subsequent party Central Committee plenums, the 19th Komsomol Congress, and mobilizing young personnel to honor in a worthy manner the 5th Armed Forces Conference of Komsomol Organization Secretaries. Offering a personal example to his comrades, Sr Lt V. Radin worked persistently to improve his flying proficiency. He pledged to become a military pilot 1st class by the end of the winter training period. And one could cite many examples of competition producing great benefit in the development of young combat pilots.

On the threshold of the 60th anniversary of award of the name of V. I. Lenin to Komsomol and convening of the 5th Armed Forces Conference of Komsomol Organization Secretaries, the Komsomol committees and buros of the units and subunits of the air forces of the Group of Soviet Forces in Germany are showing great concern with increasing the specialized knowledge of young personnel and gaining a consummate mastery of their aircraft and weapons. Very helpful in this regard is the competition for the title "Best in Occupational Category," which is being held in several stages. With effective help and support by the command authorities, Komsomol activists are guiding the entire competition toward improving knowledge, teaching young personnel effective and efficient equipment operation and maintenance techniques, exchange of know-how, and dissemination of advanced work methods.

One of the main objectives of the competition is to secure flight operations safety. Considerable experience in this regard has been amassed by the Komsomol organization of the regimental technical maintenance unit headed by Lt I. Sklyanchuk. In this unit the young aviation personnel are successfully implementing the initiative entitled "A Komsomol Guarantee to Maintenance Procedures." The Komsomol committee and buro, jointly with the technical maintenance unit command authorities, analyzed in detail the state of affairs in the Komsomol groups pertaining to ensuring high quality of performed maintenance procedures and reached the conclusion that the young aviation personnel possess every capability successfully to accomplish the assigned task.

The initiative was discussed at an open subunit Komsomol meeting. They formed a headquarters staff, which included specialists 1st class and representatives of all groups. They included young party member Lt Tech Serv O. Skryl', expert at his job, who had mastered several related occupational specialties.

Technical posts went into operation in all groups, continuously monitoring completeness and quality of performance of maintenance procedures, observance of orderly procedure at work stations, and checking to ensure tools and test equipment are in good working order. Each week members of the technical

monitoring posts make inspections to determine the state of affairs in each Komsomol group. These inspections always include the participation of representatives of leader personel and the technical maintenance unit Komsomol buro. At the end of the week a headquarters staff meeting is held, attended by technical maintenance unit leader-Communists, at which they determine the winner, synthesize critical comments, and formulate ways to correct deficiencies.

News flash sheets and special bulletins showing ways to achieve high performance results in military labor are devoted to vanguard aviation personnel. Komsomol measures are taken against personnel who are careless in servicing equipment. Komsomol member A. Astaf'yev, for example, made a mistake during performance of maintenance procedures and displayed a negligent attitude toward storing tools. At the recommendation of the technical post, he was summoned to appear at a Komsomol meeting. His comrades took him severely to task for his errors of omission. It was decided to look after this lagging-performer specialist. With the aid of Komsomol group organizer WO V. Shmakov and Komsomol member N. Romanyuk, Astaf'yev succeeded in correcting his deficiencies, changed his attitude toward his job, and improved his proficiency rating. Thus not only technical problems but also matters pertaining to training and indoctrination of young personnel are resolved in the course of socialist competition and implementing initiative.

The technical maintenance unit Komsomol members devote unabating attention to improving the quality of routine inspection and maintenance procedures and performing them more rapidly. In connection with this, considerable importance is attached to mastering related occupational specialties by aviation personnel. Tangible results are produced by supplementary training classes, technical study group sessions, well-conceived and organized independent specialist training. Now the majority of them, such as Komsomol members extended service Jr Sgt T. Mamedov, Sgt N. Melkolukov, and many others, for example, can perform inspection and maintenance procedures in 2 or 3 sequences. More than half of the subunit's Komsomol members have mastered related occupational specialties to date. A particularly fine job of performing servicing and maintenance operations on aircraft is being done by Komsomol activist WO S. Mishin. He has averted malfunctions on several occasions. For quite some time now the young aviation personnel have not experienced any near-mishap air situations, and the subunit has maintained its excellent rating for 14 years in succession. This is the result of an innovative approach to organization and conduct of socialist competition, support of valuable initiatives, and their utilization for purposes of training and indoctrination of Komsomol members and all young personnel.

There is still plenty of improvement to be made, however. Sometimes, for example, advanced work techniques and methods are disseminated too slowly, or are sometimes forgotten entirely. Komsomol activists are concentrating their attention on these unresolved matters.

In view of the tense international situation in connection with the aggressive intrigues of imperialism and the specific features of stationing of our units in the immediate vicinity of NATO member nations, on the territories of which U.S. Pershing and cruise missiles are deployed, Komsomol activists display

constant concern for developing in young personnel a high degree of political vigilance and burning hatred toward the enemies of peace and socialism.

In the Komsomol organization headed by Komsomol member A. Belkov, performance of guard duty is unrelentingly monitored. An important role in successfully accomplishing this task is played by competition for the title "Excellent Sentry." It is focused on improving the quality of performance of guard duty, strengthening discipline, and unifying the military collective.

According to the competition rules ratified by the command authorities, in order to be a winner one must earn a rating of excellent in combat and political training, master the art of unarmed combat and bayonet fighting, master all types of small arms available in the subunit, and perform guard duty in an exemplary fashion. All the men of the subunit added to their socialist pledges a point dealing with participation in the competition. The Komsomol buro is seeking to inject a spirit of competitiveness, aggressively publicizing the achievements of the best performers. An advanced know-how stand has been set up, for example, revealing the secrets of the military proficiency of the finest personnel, such as Jr Sgt A. Shkel'. Every day a performance grade is placed on a "Guard Duty" display stand for each man, with the total number of hours he has stood guard duty. There are always a lot of people around the display. Komsomol members exchange views and appraise their achievements and errors.

In the course of competition the Komsomol buro organizes communication with former combat veterans, relatives and loved ones of today's defenders of the homeland. Their experience is particularly valuable in that they experienced the test of war. For this reason Komsomol members always listen with close attention to the advice and admonitions of the veterans. In addition, aviation personnel set up a wired special training classroom, where each day the guard detail is briefed. In carrying out their assigned task, Komsomol activists N. Khomenko and B. Teterin promptly synthesize the experience of the best sentries, mobilizing aviation personnel to stand guard duty in a vigilant manner. Platoon agitators also swing into action. They promptly brief their fellow servicemen on events in this country and abroad, use specific facts to reveal the military danger emanating from imperialism, and focus their comrades on prompt and high-quality performance of assigned tasks in their statements, news bulletin leaflets, and printed newsflashes.

The effectiveness of competition is regularly analyzed in the Komsomol organization: the best achievements are publicized, and measures are taken to correct deficiencies. Winning personnel, at the request of the Komsomol committee, are awarded the title "Excellent Sentry" by a unit order, are given a pennant, their successes are reported to their home town, while the best performers are given a leave to take a trip home. Such competition helps improve the quality of performance of job duties by aviation personnel and helps increase personnel vigilance.

The cited examples show only in part the great complexity and diversity of that work which is being done in our units and subunits. There is a continuous search for the new going on in all areas where Komsomol members are working, with valuable initiative displayed and new innovations appearing.

Right now, at the end of the winter period of training, it is very important to look back at what has been accomplished, for there is not a single subunit in the air forces of the Group of Soviet Forces in Germany which would not make ambitious socialist pledges in the year of the 5th Armed Forces Conference of Komsomol Organization Secretaries. Enthusiastic words should be backed up by equally ardent deeds. To achieve this it is essential soberly to scrutinize mistakes and shortcomings in one's work and to evaluate them frankly. But we are hindered most frequently, as was noted at the June (1983) CPSU Central Committee Plenum, "...by organization without substance and showy ballyhoo. There is a lack of ability to finish the job and to work with a high degree of personal effort not only in exceptional conditions but also in a conventional, normal situation."

And we are endeavoring to concentrate our main attention on correcting these deficiencies. The forthcoming conference of Komsomol organization secretaries will unquestionably produce specific recommendations on further increasing the aggressiveness of Komsomol organizations. It is the duty of each and every Komsomol member to take them as a guide to action.

3024
CSO: 9144/347

UNITED STATES CONDEMNED FOR PAST, PRESENT NUCLEAR WEAPONS ACCIDENTS

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) pp 14-15

[Article, published under the heading "Imperialism -- Enemy of Peoples," by Engr-Capt 1st Rank (Res) L. Chernous'ko: "Dangerous Playing With Fire"; based on materials published in the foreign press]

> [Text] The higher the Pentagon builds the arms pyramid, the more crucial becomes the danger of a chance nuclear explosion, which could lead to a serious international conflict and mass loss of lives. This threat is growing in connection with implementation of Washington's sinister plan to deploy approximately 600 Pershing II and cruise missiles with nuclear warheads on the territory of a number of European countries -- U.S. NATO allies.
>
> People of good will throughout the world fervently support the peace-seeking initiatives of the Soviet Union and the nations of the socialist community, directed toward holding the arms race in check, toward accomplishing a freeze and ultimately the destruction of nuclear weapons. Peoples do not want a Hiroshima and Nagasaki on a world scale.

Bombs Continue to Fall

Thirty-eight years ago only two atomic bombs were dropped by U.S. aircraft, but they destroyed two large Japanese cities, leaving behind a somber memory and evoking the curses of millions of people. Before the ashes had even cooled, U.S. military and political leaders were already planning a new crime -- atomic bombing initially of 20, and subsequently of 70 Soviet cities. The sinister schemes of the nuclear maniacs across the sea came to naught due to the invincible might of the Soviet State.

Even today, however, nuclear bombs are falling from U.S. military aircraft. It is true that they are not being dropped on command, but as a result of mishaps or criminal negligence. Fortunately they have not detonated. But what an irreparable calamity they could bring to mankind if they were to detonate! It is the irony of fate that many of them have fallen onto U.S.

soil. One such "accident" took place in January 1961 in North Carolina. Two 24-megaton nuclear bombs were dropped by parachute from a B-52 strategic bomber in distress. The parachute of the first bomb failed to open, and it bored deep into the ground, contaminating the soil with radioactive elements. The second bomb came down by parachute into a forest, where five of its six self-contained safety devices were smashed from the impact against trees and the ground. If the last safety device had failed, it was noted in the U.S. press, an immense explosion would have occurred, thousands of times more powerful than those which destroyed Hiroshima and Nagasaki. The Americans made a detailed calculation: the detonation of such a bomb, over Detroit, for example, would take 1.8 million lives, and produce approximately an equal number of injury victims.

Some time later another B-52 strategic bomber had a midair accident. And two atomic bombs were dropped from it as well. The parachute of one of the bombs deployed, while that of the other did not, and it broke up upon impacting the ground. It did not explode. According to U.S. calculations, this was the 21st dangerous mishap out of 32 which took place in 1961.

In order to reassure the public, Pentagon and White House spokesmen stated that various steps had been taken to prevent future such incidents. However, "losses" of bombs did not cease, and even assumed a more dangerous character. On 17 January 1966, for example, a B-52 bomber, while refueling over the Mediterranean, collided with the tanker aircraft. Both came down near the Spanish village of Palomares. One of the four hydrogen bombs on board the B-52 ended up in the water, while the three others came down on land. The conventional explosive in two of them detonated upon impacting the ground. Bomb fragments and bits of plutonium were scattered over the fields around the village. Similar accidents took place on the west coast of Greenland, as well as near the Canadian city of Toronto.

Dangerous incidents involving nuclear weapons are designated "broken arrows" in America. In spite of this clever sounding public relations sobriquet, information about these "arrows" is concealed, if possible, or played down by the Pentagon. But nevertheless information about such accidents makes its way into the newspapers. For example, the public was made aware of an incident where a B-47 bomber, while landing at a British airbase 30 kilometers from Cambridge, went off the runway and smashed into a building where three hydrogen bombs were stored. If they had exploded, "part of East Anglia could have been turned into a desert," stated a Royal Air Force general. Other mishaps involving B-47 aircraft also became known. While taking off from an airbase in Morocco, a bomber carrying a nuclear device on board caught fire, resulting in radioactive contamination of the area. An aircraft carrying two nuclear capsules on board, which were part of a detonator device, disappeared without a trace in the Mediterranean. After colliding in midair with another aircraft off the coast of Georgia, a B-47 dropped an atomic bomb into the mouth of the Savannah River, which was never recovered.

The so-called U.S. Independent Information Center believes that there have been at least 100 such incidents. "We can anticipate a most frightful nuclear incident in the near future," warned the director of this center, retired vice admiral G. LaRoque.

On the Brink of Catastrophe

Mistakes, acts of carelessness and inexactitude.... The U.S. military has time and again put the world on the brink of catastrophe in recent years through the above. A horrible incident occurred in November 1980 at McConnell Air Force Base near the city of Wichita, Kansas. Specialists conducting ground tests on a Titan ICBM suddenly saw on the control console screen the words "Launch Authorized," followed by "Proceed With Launch." The unexpectedly appearing commands could mean only one thing: the missile was ready to launch. Very little was required to put it into the air.... They were able to interrupt the launch sequence in time.

There have been several such dangerous incidents involving Titan missiles. According to U.S. Air Force figures, 125 cases of leakage of toxic fuel on 54 fixed-site missiles were recorded just in the period 1975-1979. On one occasion two persons were stricken as a result. Fuel ignited on another occasion; dozens of persons died in the ensuing fire.

The present U.S. Administration, stepping up the arms race, is accelerating the development of the MX first-strike missile, neutron and chemical munitions, as well as other weapons of mass destruction. Sober-minded Americans correctly conclude that the greater the number of atomic weapons in that country, the more acute the problems of security become. The risk of an accident also increases with each new added unit of nuclear arms.

Following Washington's reactionary course of policy, during the Anglo-Argentine conflict the British Government dispatched to the Falkland Islands (Malvinas) warships carrying nuclear weapons on board. One of them, the destroyer "Sheffield," was sunk in battle, with nuclear weapons ending up on the bottom of the Atlantic. Now, if the protective casing is damaged, radioactive charges will commence contaminating the waters of this vast ocean, including every living creature in it. Who should bear responsibility for this? The aggressive imperialist circles, of course, which unleashed the military conflict.

The Environment in Danger

Bourgeois propaganda, a faithful servant of imperialism, is not averse to arguing that the arms race can bring death and destruction to mankind only in case of war. But the amassing of vast stockpiles of weapons has already inflicted and is continuing to inflict on mankind ever increasing losses, the true dimensions of which are difficult to estimate at present. The level of radioactivity in the air, soil, flora and fauna has risen as a result of atomic and hydrogen weapon tests, and in a number of instances involving substantial doses. Many prestigious scientists are of the opinion that this has resulted in an increased cancer rate and that certain biological-genetic changes are taking place. The negative consequences fo nuclear weapons testing may be particularly seriously manifested during the lives of future generations. Polluting of the environment is continuing, and the planet's ecological balance is being disrupted.

The world community is protesting U.S. dumping of radioactive waste into the World Ocean. Ignoring this, the Pentagon is continuing its pernicious practice. According to Reuters, at least 37 such incidents have been recorded, incidents which are fraught with dangerous consequences. A U.S. nuclear submarine, for example, dumped radioactive waste in a bay on the island of Guam (Pacific Ocean). As a result the radiation level on the island's beaches exceeded the allowable level 50-fold.

The atomic bombings of Hiroshima and Nagasaki claimed hundreds of thousands of lives, and many of the survivors are still suffering the aftereffects. But there have also been many victims in peacetime as well. These include first and foremost the residents of the islands in Micronesia where U.S. nuclear weapon tests were conducted. The radiation level on some of these islands is so high that they have been declared dangerous to human life. A TASS statement dated 13 August 1983 emphasizes: "The Micronesians are still experiencing the harsh consequences connected with forced resettlement and poisoning of the environment, which seriously threatens the life and health of the present and future generations of Micronesians." In light of the above, what is the value of the hypocritical statements made by certain U.S. officials about defense of human rights?

Japanese fishermen have also suffered from U.S. nuclear weapons tests. And the Americans themselves are being affected by the consequences of such tests. It was reported in the foreign press, for example, that there has been a sharp increase in the incidence of cancer among the residents of certain states. The reason for this was nuclear weapons testing in Nevada, which the Pentagon is stubbornly continuing to this very day. It was noted in the press that radioactive fallout contaminated ranches and grazing lands, hay and livestock feed, including dairy cattle feed, orchards and farms, mines and quarries.

The American public was furious at the position taken by the authorities. For many years now the U.S. Government has ignored all warnings and complaints by local residents, who are regularly exposed to radioactive fallout from atomic-bomb tests. The people in the White House are more concerned with arguments about the "acceptability" of nuclear war than with the legitimate demands of common citizens, calling them "Communist propaganda."

NORAD In Panic

...A panic broke out at NORAD, headquarters of the North American Air Defense Command. Telephones were ringing incessantly. Officers and general officers were running from office to office. The militant guardians of U.S. "national interests" ordered aircraft carrying nuclear bombs to go airborne and placed all strategic forces on combat alert.

What had happened? A phony report that "the Russians are coming," so much in style in U.S. propaganda? Or were they perhaps imagining an invasion by extraterrestrial beings? No, the warriors across the Atlantic had been let down by their own hardware -- headquarters computers had distorted the air situation. And panic erupted, threatening mankind with a major catastrophe.

What will be next: another error, temporary insanity or psychosis on the part of duty personnel? To what extent can one play with fire? To this extent: PARADE magazine reports that there have been recorded in the United States 151 incidents of false nuclear alerts and 3,703 warnings of a "less serious nature," in the opinion of officials. Each of these, however, in conditions of the militarist psychosis being whipped in that country, could have led to the igniting of an all-destroying nuclear conflagration.

A question involuntarily arises: what will happen if some computer error is not detected in time? If the United States begins World War III, dispatching to designated targets not only its strategic bombers but also its intercontinental missiles, which cannot be halted or recalled?

Particularly dangerous is the "launch on warning" position taken by NORAD headquarters, that is, launching missiles immediately upon receiving an alert warning. Will this policy not lead to "easy" and "automatic" unleashing of war? Referring to this danger, Senator Hatfield once exclaimed: "We are standing on the brink of an abyss!"

Everything which is poisoning the American nation -- the cult of violence, gangsterism, and drug addiction -- has in full measure touched the military as well. U.S. military personnel are frequently involved in drunken brawls, robberies, and other crimes. According to reports in the foreign press, approximately 30 percent of U.S. military personnel smoke marijuana, while 10 percent use more powerful drugs. The U.S. press has reported that in the course of a single year 1,474 military personnel were removed for using drugs from units directly involved with nuclear weapons. And can a major calamity be far off if nuclear force control consoles and launch buttons are manned by personnel under the influence of narcotics, persons with various moral-psychological deviations?

The dangerous game being played with atomic fire by the militarists across the ocean is continuing. Current Washington "strategists" dream of a new "crusade" against socialism, are escalating the nuclear missile arms race on an unprecedented scale, and are already examining space from a military standpoint. But the very increase in nuclear megatonnage in the United States and the other NATO countries is immeasurably increasing the danger that it could be put into motion either by virtue of a military-political miscalculation and adventurism on the part of ruling circles, or accidentally as a result of technical "glitches," which could serve as a detonator of a worldwide thermonuclear outburst. It is high time for Washington to give serious thought to the great danger of the arms race and nuclear blackmail. They should heed the appeal sounding from Moscow: "Remove your fingers from the triggers and put your weapons on safety."

3024
CSO: 9144/347

BOOK STRESSES IMPORTANCE OF POLITICAL INDOCTRINATION IN MILITARY

Moscow AVIATISIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) pp 16-17

[Article, published under the heading "Assisting the Propagandist," by Maj N. Antonov: "Inspiring to Military Exploits"]

[Text] Leading elements of the 40th Army, smashing through enemy screening forces, were advancing toward the Dnieper. A truck loaded down with sheets of plywood suddenly surged forward.

The truck halted. Soldiers, jumping down onto the ground, proceeded to put up on the side of the road leading to the river plywood sheets bearing the message: "The Dnieper Is Quite Close. Forward!" "Heroes of the Volga and Don, the Dnieper Awaits You! Pursue the Enemy, Give Him No Breathing Space!", and "A Single Day's March to the Dnieper. Forward, Soviet Fighting Men!" It seems an army political section agitation truck was accompanying the lead elements....

Seven or 8 kilometers short of the Dnieper, on a sheltered site, a group of performers from a Red Army song and dance company was giving a final concert on the Left Bank. The hushed soldiers, who would be fighting their way across the mighty river in a few hours, listened attentively to the soloist, who was singing the "Song of the Dnieper," to accordion accompaniment. Scarcely had the concluding words of the song died out, words permeated with faith in our victory: "Like the Dnieper in spring, our army, our people will sweep away all foes," a soldier in the audience shouted: "You show 'em, Dnieper!" This exclamation was immediately drowned out in a mighty shout of approbation.

Visual agitation, the spoken word, and inspirational fighting songs were used during the Great Patriotic War to mobilize soldiers to perform combat exploits. This is discussed in the book "Kogda gremeli boi...." [When Battles Raged]*.

---

* Podobed, I. M., and Komskiy, B. G., "Kogda gremeli boi...: Kul't.-prosvet. rabota na fronte v gody Velikoy Otechestvennoy voyny" [When Battles Raged...: Cultural-Educational Work on the Front During the Years of the Great Patriotic War], Moscow, Voyenizdat, 1983, 239 pages, 50 kopecks.

On the basis of extensive factual material, the authors show what an important role was assigned to cultural-educational work in forming excellent moral-political and fighting qualities in personnel.

Operating in a difficult combat situation, commanders, political agencies, party and Komsomol organizations, as well as cultural and educational establishments concerned themselves daily with providing political, military, and aesthetic indoctrination to enlisted personnel, NCOs, and officers, and with maintaining a strong fighting spirit in the men.

From the very first days of the war our party's Central Committee devoted unabating attention to improving agitation and propaganda work, instructing that it be directed toward accomplishment of the combat missions assigned to the troops. The activities of cultural and educational establishments took on new forms, engendered in the conditions at the front and prompted by the combat activities in progress. There occurred a great increase in the percentage share of such forms of oral propaganda and agitation as the lecture, report, and talk. Between October and December 1942 alone, for example, when heavy fighting was in progress at Stalingrad, lecturers of the Stalingrad Front gave more than 400 talks to the fighting men in the most critical sectors. The topics of the lectures and reports were closely tied in to the military-political situation: "The Party of Lenin Is the Organizer of the Struggle Against the Invaders," "We Shall Build Upon the Fighting Traditions of Tsaritsyn," "Iron Military Discipline Is a Guarantee of Victory for the Red Army," plus others.

Cultural-educational work was also particularly active later, during large-scale offensive operations. Military propagandists worked tirelessly in the most difficult situations. The authors point out, for example, that within a short period of time in the summer of 1943 agitation truck chief Major Petrov gave 35 lectures. Major Leonyuk gave an equal number. "The lecture on the international situation given by Major Leonyuk to command personnel, which was attended by 110 commanders," stated a report, "was listened to with great interest. Clear in content and backed up by examples and official figures, it exhaustively satisfied the commanders."

The authors note that a central position in agitation and propaganda work was assigned to patriotic indoctrination of military personnel, dissemination of the revolutionary and fighting traditions of the Communist Party, the Soviet people and their Armed Forces, and explanation of the domestic and foreign policy of the party and government. A dedicated hatred toward the enemies of the socialist homeland was instilled in Soviet fighting men. Friendship and fighting brotherhood among the peoples of the USSR were propagandized. An essential condition for successful performance of this work was a close link between agitation-propaganda and cultural-educational measures. The arsenal of means of influencing enlisted men, NCOs, and officers was expanded, and new forms were sought. Brief political rallies, question-and-answer evenings, and oral newspapers proved effective. Why was this? The book answers this question. As a rule these measures, which did not last very long, were purposeful, saturated with content, carried a strong emotional charge, and could be quickly organized in the difficult battlefront conditions.

Here is how a fighting traditions evening was held, for example, in a certain guards regiment. The presentation was brief, saturated with nothing but factual material. This was followed by statements by guardsmen who had distinguished themselves in combat with the enemy and had amassed valuable battlefront experience, so needed by the new replacement troops. The evening ended with an amateur talent concert, which included pieces specially written for this event.

Incidentally, as the book's authors point out, amateur talent activity took on the broadest scope during the war years. The Main Political Directorate demanded that efforts pertaining to adopting and incorporating amateur talent activities be viewed as a component part of political indoctrination of military personnel. The army and navy adopted a fighting song and perky musical limerick, a heroic tale, and a merry dance. In the 3rd Ground-Attack Aviation Corps alone more than 500 pilots and ground crewmen presented various genres. In 1944 amateur performers of the 23rd Air Basing Area presented 297 concerts for flying unit personnel. A performing group formed under the auspices of the 250th Airfield Servicing and Maintenance Battalion club gave 14 performances for officers and enlisted men just in October-December 1944.

As a rule amateur performing groups contained bold, innovative men who enjoyed the respect of their comrades. For example, in the aviation regiment commanded by Hero of the Soviet Union Ye. Preobrazhenskiy, the commander himself and pilots Heroes of the Soviet Union P. Khokhlov and M. Plotkin were active organizers of and participants in amateur shows. Aircraft technician Kirill Lavrov, today a USSR people's artist, played his first role in an excerpt from the play "Russian People," on an improvised field stage; Yuriy Nikulin, who also became a USSR people's artist, made his debut under similar circumstances.

The authors present many examples of instances where cultural and educational establishment people skillfully utilized the talents of amateur painters and photographers. There were such persons in every outfit. A photograph or drawing spiced up operational news sheets and wall newspapers. The authors tell the readers how Lt P. Kirpichev, who was with his unit in Malaya Zemlya, in a short period of time was able to make more than 200 drawings depicting the battlefield, the difficult life at the front, as well as portraits of hero-soldiers.

Cultural and educational work experience during the years of the Great Patriotic War was rich and diversified. It unquestionably requires innovative study, utilization, and development. It was noted at the June (1983) CPSU Central Committee Plenum: "We have at our disposal a very rich arsenal of means of education and indoctrination. They include the print media, radio, television, and oral propaganda.... The task is to utilize all these means more correctly, to apply them more vigorously and innovatively...."

Carrying out the demands of the Communist Party, commanders, political workers, party and Komsomol organizations seek to ensure that the content of ideological work, including cultural and educational activities, become more

relevant and effective and that the forms employed meet present needs and requirements of aviation personnel. The book "When Battles Rage...." will assist them well in this important and necessary activity .

3024
CSO: 9144/347

CASE OF MYSTERIOUS AIRCRAFT LOSS OF CONTROL ANALYZED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 4 (signed to press 6 Mar 84) pp 18-19

[Article, published under the heading "Practical Aerodynamics for the Pilot," by Engr-Col (Ret) Professor N. Lysenko, doctor of technical sciences; Engr-Col N. Siritsa, candidate of technical sciences; Lt Col N. Litvinchuk, military pilot-instructor 1st class, and Engr-Maj V. Vovk: "Why Did Rotation Occur?"]

[Text] The air near-mishap situation we shall discuss in this article took place long ago. Its causes, however, revealed in the subsequent investigation, are of considerable interest both from the standpoint of theory and practice.

During a two-aircraft flight in VFR weather, during a climbout the wingman's aircraft was thrown to the right. A complete picture of what happened could not be fully reconstructed from the account given by the two pilots. The wingman maintained that during takeoff he had precisely maintained his position in formation and had executed the leader's commands. Suddenly and unexpectedly, with negative G-loadings, the aircraft commenced rotating to the right, which he was unable to counter. In addition, according to the pilot's account, the stick jumped full forward, slipping out of his hand, and held in that position. When rotation ceased and aircraft speed and negative Gs lessened, the stick returned to neutral position, and he was able to continue the flight.

The leader stated that the wingman had been climbing out at an increased spacing, after which he had executed two turns toward him and had commenced closing rapidly. Attempting to avoid a collision, the leader went into a sharp climb and radioed to his wingman. The latter did not reply immediately.

It was clear that the incident had been caused by rotation on the roll axis. But what caused it? Experts postulated that the aircraft could have entered the wake of the leader's aircraft, that the control system could have failed, or that the pilot had been at fault. Analysis of the flight parameters tape from the SARPP-12 flight recorder of both aircraft (Figure 1) indicated that at the moment rotation of the wingman's aircraft commenced, with the aircraft at approximately the same altitude, the closing speed of the two aircraft had increased from 40 to 80 km/h due to a simultaneous slowing of the leader's

aircraft and speed increase by the wingman. At an altitude of 1,900 meters the wingman had initiated a turn, simultaneously dive-deflecting the tailplane 6.8 degrees. This reduced the load factor to from -0.3 to -0.5. Subsequently the tailplane was fully dive-deflected for 1 second, producing a negative load factor of approximately 5 Gs. This created the conditions for the aircraft to initiate aeroinertial rotation (Figure 2) [not reproduced], which began approximately 1 second after the control shifted forward.

At the same time the SARPP-12 tape from the leader's aircraft recorded a pitch-up tailplane deflection and a load factor increase to 2.6 Gs positive. This indicates that the most probable cause of the abrupt rearward deflection of the leader aircraft control stick and the forward deflection of the wingman's control stick, during rapid closing at the same altitude, was the danger of collision. Analysis of the flight recorder tapes made it possible to eliminate the hypothesis that the cause of the aircraft's rotation could have been entry into the other aircraft's wake.

Possessing a certain inertia, an aircraft responds with some delay to tailplane deflection with a change in load factor, that is, change in load factor is preceded by tailplane deflection. If the load factor changes due to external influences, the tailplane deflects to counter them with a certain delay. In this instance tailplane deflection was preceded by a change in load factor.

It was evident from the flight recorder tapes that the load factor was following the tailplane with a certain delay. The recording line was not diffuse. This indicates the absence of jolting and convincingly shows that the wingman's aircraft had not entered the wake of the leader's aircraft prior to initiation of aeroinertial rotation.

The flight recorder confirmed another curious detail from the pilot's debriefing. Having deflected fully forward, the control stick did not return to neutral position for some time, although he was not holding it. What was happening? Control system failure? Careful examination of the control linkages, however, and the fact that the control components and drives were in proper working order eliminated this possibility. It was determined that the control stick can be held in deflected position even with neutral trim and sufficiently powerful control drives. We shall analyze this in greater detail.

The aggregate absolute control stick displacement can be considered as the sum of two of its motions: relative, that is, displacement relative to aircraft-bound system of coordinates $OX_1Y_1Z_1$ (plus or minus X_V), and transient -- motion together with the aircraft. Absolute velocity of displacement is formed of the geometric sum of the velocities of these motions, while acceleration is formed of a like sum of relative, transient, and Coriolis acceleration.

Longitudinally the controls are linked with the aircraft by the roll axis. Thus it is rigidly linked with aircraft in translatory forward motion. Rotationally, however, it is linked by means of loading springs, trim mechanism, dry and viscous friction forces.

Inertial forces will act on the control system in translatory forward motion with G-loads. If their component does not cross the roll axis, the system

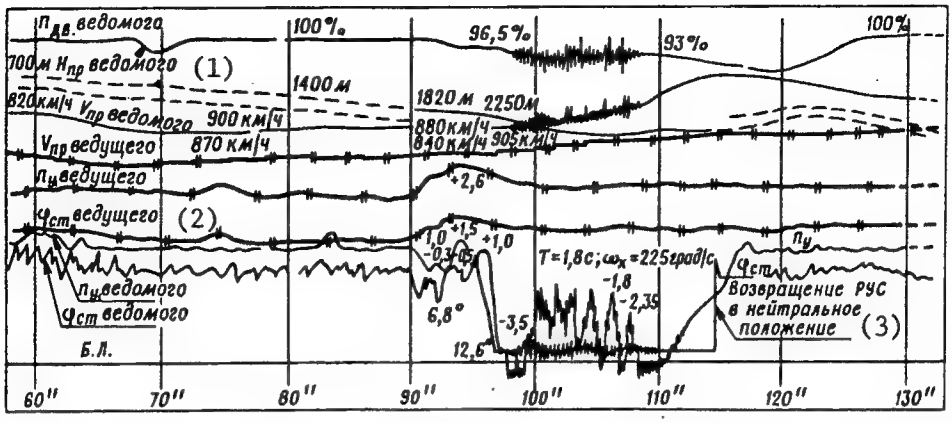


Figure 1. Record of Flight Parameters of Wingman and Leader (figures 2, 3, see back cover) [not reproduced].

Key: 1 -- wingman; 2 -- leader; 3 -- control stick returns to normal

---

does not possess mass balance, and there will develop an unstable control stick motion moment, corresponding to the moment from forces $R_V P_u$ and $R_V P_x$ applied to it.

In translatory accelerated rotational motion relative to the OZ_1 axis, the control stick will tend to maintain its position relative to an inertial frame, and the pilot will perceive this as a stick displacement relative to the cockpit under the effect of forces R_{VOZ}. During aircraft rotation relative to the OZ_1 axis, centrifugal forces will act on the control system, the moment of which forces displaces the controls. We shall designate the aggregate applied force of this moment R_{VC}, and the force acting on the system during aeroinertial rotation -- R_{Vir}. The control system may also be affected by forces from the interaction between pilot and controls, forces by the loading springs, trim mechanism, dry and viscous friction forces.

In particular instances the quantity of forces acting on the control may be considerably less. In a given situation the final stage is simplest from the standpoint of analysis, a stage characterized by cessation of rotation and by motion with the controls deflected fully forward, with negative Gs. In our case the control stick (RUS) could be maintained in deflected position only under the effect of forces $R_V P_u$, $R_V P_x$, and R of friction, which should be greater in magnitude than loading spring tension forces. If one considers the control system weight balanced (as a rule the design engineer endeavors to accomplish this), quantities $R_V P_u$ and $R_V P_x$ can be disregarded, and frictional force can be viewed as the only force capable of holding the control stick in deflected position.

The frictional force acting on the aircraft control system constitutes the sum of dry and viscous friction forces. Since viscous friction forces can be disregarded in initially moving the controls or with insignificant velocities of control stick displacement, we should consider only dry friction. Its magnitude, ignoring deformations of airframe and control systems in conditions of G loads, is determined as follows: $F_{fr}=fN$, where f is coefficient of friction; $N=mgn$ -- reaction force (m -- mass, n -- load factor).

The following relation is valid for the control system rolling-contact bearings:

$$f = f_r + \frac{K_p \omega_s}{NR},$$

where f_r -- coefficient of friction for low rpm (determined experimentally for one bearing or a bearing system); K_p -- empirical proportinality constant; O_s -- angular velocity of cage; N -- load on bearing (in kg); R -- shaft radius (in cm).

The value of f_r during normal bearing operation ranges from 0.002 to 0.02. The coefficient of friction in ball bearings upon initiation of movement significantly exceeds f_r.

One should bear in mind that not actual but applied friction forces act on the lower part of the control stick:

$$F_{fr.no} = \sum_{i=1}^{n} f_i N_i K_c,$$

where f_i -- coefficient of friction of i element of the system; N_i -- reaction forces of control system element i; K_c -- coefficient which figures in kinematics of control system linkages, in particular its mechanism of nonlinearity.

Friction forces applied to the control stick will be determined by the following expression: $R_{fr}=F_{fr.no} \times (Ll/Lu)$, where Ll -- length of control stick lower arm; Lu -- length of control stick upper arm.

Dependences R friction on angle of control stick deflection and load factor and loading spring forces on control stick travel and arm ARZ [Automatic Device for Controling Load Factor of Aircraft Stick Control] (airspeed) $R_{z.m}$ are shown in Figure 3 [not reproduced]. The relationship between friction force in G load function and control stick deflection can be determined experimentally, employing a dynamometric stick and regular KZA [expansion unknown]. In this case, during flight at a specified G load, one measures the forces necessary to displace the control stick a small amount rearward and forward. $R_{fr}=(_v$"rearward"$-R_v$ "forward"$)/2$. From the ratio of forces R_{fr} and $R_{z.m}$, depending on load factor and control stick travel, one can determine the stick retention zone (Figure 3) [not reproduced]. For aircraft control systems they as a rule encompass a range of trim values of angles of attack and load factors outside the operating envelope, but it is possible to induce such values, especially with abrupt control movements.

Upon entering the region connected with forward movement of the control stick, the action of negative Gs helps the pilot deflect the control stick in that direction and hinders, but does not exclude the possibility of pulling the stick rearward.

If the control system is not fully weight-balanced, control stick displacement can be affected by centrifugal forces generated during aircraft aeroinertial rotation. Applied to a fully-forward control stick, these forces in the case under consideration comprised not less than 2-3 kg, which could also contribute toward keeping it deflected during rotation, and impeded the pilot from bringing it back to neutral position.

Thus one can conclude that the most probable reason for the aircraft entering aeroinertial rotation and its subsequent behavior was abrupt control stick displacement forward in the presence of angular velocity of rotation on the roll axis. The magnitude and direction of the forces acting on the control system made it possible to hold the control stick deflected fully forward.

This character of change of forces during aircraft unstable motion, and in particular the relationship between frictional force in the control system linkages, load factor and mechanism of nonlinearity must be considered when designing and operating aircraft and when examining the characteristics of manual and automatic control systems.

3024
CSO: 9144/347

RECON PILOT JUSTIFIED RISK-TAKING CONSIDERED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) pp 20-21

[Article, published under the heading "The Reader Reflects," by Doctor of Military Sciences and Professor Col A. Krasnov: "Risk and Calculation"]

[Text] I once happened to hear the following conversation between two pilots.

"Risk in air reconnaissance," said one, "is inevitable. A genuine reconnaissance pilot should be daring, ignoring the danger lurking in wait for him over the objective, for it is correctly stated that risk is a noble thing."

"As I see it," the other pilot retorted, "precisely reconnaissance does not tolerate daredevil recklessness. He who takes a risk while hoping to be lucky pays dearly for that risk. There is no question that accomplishment of the combat mission is the main thing. Nevertheless precautionary measures should be unswervingly observed in a combat situation as well."

"But the situation uncertainty behind enemy lines and our very profession make us engage in risk. If you start being too cautious, you will not achieve very much."

"Nevertheless, every flight begins with ensuring its safety. This is a unique passport into the air. All mission actions have been described and scheduled in detail. Execute them with precision, and it will not be necessary to take a risk. But if everybody starts taking risks, what will be the result? It is a short distance from here to lack of discipline bordering on adventurism."

"I don't agree. Who said an air mission excludes aggressive activeness, initiative and risk? The greater a pilot's tactical proficiency, the more boldly he can decide to take a risk. More difficult missions are assigned to such a pilot, and he is entrusted to carry them out in more difficult conditions...."

Let us leave the debaters and think about the matter.

Once Capt V. Tregubov, who was well trained and prepared, took off on a mission to reconnoiter "aggressor" forces. The weather in the objective area proved to be considerably worse than anticipated. The pilot, believing that he could accomplish the assigned mission, decided to continue the flight. He succeeded in spotting a column of "aggressor" troops in the middle of a heavy downpour. It remains a puzzle how he succeeded in spotting them. This combat pilot's endeavor to carry out the mission at all costs is certainly praiseworthy. We have inherited such an attitude toward the task at hand from the pilots in the war. But this example also contains another aspect.

Was Tregubov taking a risk in a deteriorated weather situation? He certainly was. With an adverse combination of circumstances, he could not have avoided disaster. The pilot could have killed himself and destroyed his aircraft. And it is difficult to say what should have been given preference, particularly since this was a training sortie. In the harsh reality of wartime, Tregubov's action perhaps would have been akin to a heroic exploit. The pilot failed to calculate the probability of successful mission accomplishment and the degree of risk. He was firmly aware that the mission had to be accomplished at all costs. During peacetime training, however, obviously one must approach such facts with a somewhat different measuring stick. The risk should not be considered as merely justified and unreprehensible. Let us compare this case with another one.

In December 1944 one of the pilots of our regiment was assigned the mission of locating a column of fascist tanks which the enemy command authorities were redeploying to the vicinity of Budapest. The weather did not favor reconnaissance. Immediately after liftoff the cockpit canopy became obscured by a solid wall of hammering rain, through which the pilot could barely make out the dim features of villages and dark patches of forest. The dull glassy surface of the Danube flashed past under the wing. The reconnaissance pilot entered the search area.

The ground was close below him. Rain lashed the canopy. Barely managing to turn and evade hills and tall trees looming up in his path, the pilot carefully scrutinized the ground. There were no tanks visible, and it was almost time to return to the field. Just as he was about to break off the search, he suddenly caught sight of a dark, elongated object on a piece of low-lying ground, obscured by a dense wall of rain. He took a closer look: armored hulls, tank turrets with long gun tubes.... Their treads biting deeply into the muddy ground, tanks were moving toward Budapest along two rain-mired unpaved roads.

Blindingly bright tracers proceeded to arc skyward toward the aircraft. Executing vigorous evasive maneuvers, the reconnaissance pilot proceeded to make a count of the black objects below. It was the fascists' 8th Panzer Division, which for quite some time had succeeded in evading observation.

In this instance the risk the pilot had taken was justified. The success of an offensive and the lives of hundreds of Soviet citizens depended on accomplishment of this mission. Only in such exceptional circumstances is a serious tactical risk accepted as unavoidable, and flight safety can be relegated to secondary consideration for the sake of accomplishing the

mission. But even in these conditions the command personnel who organized reconnaissance endeavor to come up with a mission variant which presents the least risk.

Every pilot operates in conformity with his own experience, character, and abilities, and is compelled to take a risk when necessary. He assesses the situation, chooses a tactical device, and aborts the mission if he is not sure about flight safety. Nobody will accuse the reconnaissance pilot of cowardice. Confidence is a valuable quality. It helps one make bold decisions in critical situations and evokes an influx of strength and energy. But when a decision involving a risk is made, confidence alone is not enough. It is essential clearly to delineate the line between intelligent, calculatd, and foolish risk. Risk should be justified by an acute necessity of mission execution and reinforced by well-conceived and modeled sortie variations. If a pilot heads into danger aware, for the sake of an important goal, if he not only possesses courage but knows his job well, this is intelligent risk. But if nothing stands behind risky actions other than self-assurance and hasty assessments, this is characterized as adventurism.

Of course it is much more convenient to deal with only two concepts: intelligent risk and foolish risk. In actual fact situations sometimes arise for which this "scale" is inadequate for evaluation. Nor can one make an analogy with assessment of degree of risk in other areas as well. In designing aircraft, for example, engineers may beef up or make various systems redundant, designing in a safety factor in terms of strength or reliability. These measures essentially reflect degree of possible risk. A great many things can happen on a difficult flight! This procedure is not suitable for pilots. There are no ready solutions in exceptional, unexpected situations. Therefore degree of risk is determined in relation to the specific circumstances, and one must take calculated risk in reconnaissance.

Risk and calculation. How can these terms, which seem to be contradictory at first glance, be integrated? There is no contradiction here whatsoever, however. In order to determine degree of risk, and to validate an optimal mission variation, it is necessary to model various situations, to take into consideration subjective factors (knowledge, skills, experience, moral-fighting qualities), which do not fit into mathematical models. Risk without calculation is merely a risky venture. This is why the combination of risk with precise calculation, boldness with caution, always remains valid in reconnaissance.

Occasionally something else occurs as well: pointing to the interests of flight safety, some commanders excessively emphasize and underline the dangerous consequences of risk. When this happens, pilots gradually become accustomed to excessive caution and begin unnecessarily simplifying training sorties. One is hard put to expect from these pilots initiative and ingenuity, which are so essential in aerial reconnaissance. In addition, it will be very difficult for them to carry out a mission in an actual combat situation.

Here is an example. A pilot was unable to determine the characteristics of a small object from a low altitude. Fearing that he might make an error in

flying technique, the reconnaissance pilot proceeded excessively cautiously and could not bring himself to execute a vigorous maneuver at high speed close to the ground. This is an old example, but it has retained its instructiveness as a phenomenon contrary to intelligent, warranted risk.

It is paradoxical that excessive cautiousness and playing it safe also lead to unwarranted risk. Unable to determine the characteristics of an object and to determine its map coordinates, for example, a pilot is compelled either to reduce speed or to fly additional passes. But since a reconnaissance aircraft reveals its presence with the first pass, the danger of being brought down by hostile air defense weapons inevitably increases.

Thus excessive self-confidence, just the same as excessive caution, can lead to negative consequences. It is precisely for this reason that it is very important to understand the demarcation between risk and risky venture. A reconnaissance pilot must organically combine the desired and the possible in order to justify risk. Something of the sort takes place when looking for a unique scheme for a reconnaissance mission or for air combat and in devising new tactics. Innovation in tactics is risk to a certain degree, which may result in success or a disappointing miscalculation. If the latter occurs, it is more honorable and useful, rejecting self-consoling arguments, to continue the quest, since risk cannot presume solely unconditional achievement of the goal.

How does one learn precise calculation, and how can one develop confidence, self-control, and willingness to take a risk if it becomes necessary? Pilots who have been in risk situations (when it was necessary to act after careful consideration, but exceptionally quickly and precisely, while any mistake or delay in calculation could lead to serious consequences) relate that success was fostered by skills, honed to automatic reflexes, in flying the aircraft and in operating the cockpit equipment. But the main thing nevertheless was not unthinking execution of operations, but rather skills acquired by flying training sorties in a situation approximating actual combat.

In wartime stressful and dangerous situations arise at every step. On training sorties, however, when "aggressor" countermeasures are simulated, it is difficult to find that allowable boundary of risk, its universal measuring stick. I believe that just as much persistence, courage and keenness of wit will be demanded by a sortie if an appropriate ground and air situation is artificially created.

One must also consider the fact that the tactical background in the reconnaissance area should change constantly. If reconnaissance objectives are located at the same place, then aircrews, knowing their characteristics and coordinates in advance, will end up executing one and the same maneuver. A fixed pattern is developed, since they are dealing with completed models for a given tactical situation. But the most insidious situations arise in an unstable environment filled with unexpected changes, when the employment of many maneuvers is essential.

Capt S. Legostayev had taken off on a reconnaissance sortie. He had rehearsed a similar mission dozens of times in the course of scheduled training sorties.

Each tme he proceeded along the same route, was familiar with the environment on the range and the specific features of the approach, and he kept employing the same maneuver to spot semiconcealed objectives. The pilot had become so accustomed to the procedures that he was unwittingly becoming adjusted to a uniform situation, a sole variation, which produced the desired results. And when the higher commander ordered the location of objects on the range to be changed and to be concealed and camouflaged differently, Legostayev was able to spot only a few of them. Predictable routine had done the pilot a bad turn. Other maneuvers, tactics, and of course, initiative were required to search for the reconnaissance targets. But Captain Legostayev followed his customary procedures and, upon finding himself in a difficult situation, was unable fully to accomplish the mission. On the other hand, however, one must possess a rich imagination in order under such conditions to figure on a diversity of tactics and the need for risk actions. This means that willingness and readiness to take a risk must also be developed.

Every recon man knows that he must carry out a mission in the most complex situation and be prepared for intelligent risk. Nevertheless rash actions and unwarranted risk still occur, especially when encountering a puzzling and up to a certain time incomprehensible situation. Therefore the pilot must clearly grasp the dimensions of the danger, not allow emotions to gain the upper hand over intelligence, and be psychologically prepared for surprises of any kind. Preparation in a professional, moral and psychological respect should occupy an important place in the development of reconnaissance pilots.

Development of aviation personnel into experts at their job demands constant innovative quest, new teaching devices and methods. It is also no less important to pinpoint and correct the causes of deficiencies and unnecessary situation simplifications which impede a pilot's development. Proper consideration of all these factors will unquestionably promote growth of military expertise in combat pilots and improvement in their combat readiness.

3024
CSO: 9144/347

WEATHER COMPLICATES NAVAL TARGET AIR-TO-SURFACE MISSILE FIRING EXERCISE

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) p 27

[Article, published under the heading "Be Alert, In a Continuous State of Combat Readiness," by Lt Col M. Chevychelov: "At Night Against a Naval Target"]

[Text] Two squadron aircrews were assigned a mission during a tactical air exercise: they were to knock out a naval target with missiles in a distant area where, according to intelligence, an "aggressor" had been spotted.

They took off after midnight. The moon hung over the dark forms of the rounded hills, and the distant stars shone cold and bright. The wingman, Military Pilot 1st Class Maj A. Mukhin, was engrossed in flying his missile-armed aircraft. He was concerned by the weather over the naval gunnery range. The weather forecasters were not optimistic. Winds were raging over the ocean. A weather front, accompanied by cloud conditions, was entering the range area. The mission would not be easy under those conditions. And yet the proficiency of their missile-armed aviation subunit would be judged by the results of the strike flown by these two aircraft. The aircraft navigator, Capt A. Tsybulya, was making a particular effort. He is a party group organizer, and it behooves him to perform well....

Now that they were on the mission, only a few "minor items" remained to be done. As the navigator had joked prior to takeoff, all they had to do was locate the target out in the middle of the ocean and accurately fire a missile at it. Their actions were being monitored on the ground, where people were nervously waiting for the results of the missile firing. They could not let them down. Major Mukhin had been flying with Captain Tsybulya for quite some time and knew well that this big, muscular, calm and deliberate officer would not lose his composure in any air situation. But as far as the rest were concerned.... They had not been flying with Mukhin long. Prior to this they had not performed a single difficult training sortie with them. Could they do the job? One thing was reassuring: they were backed up by Major Tolmashev's aircrew.

Time seemed to be standing still. The aviators impatiently listened for the radio message they were expecting momentarily from the weather reconnaissance

aircraft which had been sent out ahead. The report, which finally came, was not a good one: high wind velocities were reported in the target area, thick cumulus cloud cover, and a great deal of interference on the radar.... "About as bad as you can imagine," Mukhin thought to himself, disappointed.

"Did you hear, Aleksandr Ivanovich?" he turned to the navigator. "Can we do the job?"

Remaining silent a second, Tsybulya slowly replied: "We must. How can it be otherwise, skipper?"

They reached their final waypoint. They turned to a heading which would take them to the offshore range. As soon as they crossed the shoreline, rough air began shaking the aircraft violently. The radar screen rippled with interference. Major Tolmashev's aircraft was having an even worse time. It was proceeding at a lower altitude, in clouds. He hit rain upon approaching the search area.

It seemed impossible to find the target in these conditions, but in spite of the heavy interference, the navigators succeeded in picking up a very faint signal emanating from the "aggresor" ship.

"Heading... range.... Target in sight," Capt A. Tsybulya reported over the intercom.

At practically the same moment Sr Lt Yu. Repnikov reported the same information on board the other aircraft. This was followed by the customary precise report and, finally, the long-awaited: "Missile away!"

An orange exhaust flame flared in the night sky. The missile, swiftly accelerating, disappeared into the clouds. Another launch followed. How gratifying it was later to receive the good news from the distant range: both missiles had impacted the target.

squadron headquarters, containing a picture portraying a warship and aircraft bearing a red star hurtling headlong above the blue water. There is an inscription against the red margin background: "We know well that the imperialists will not simply give peace. It can be defended only by relying on the invincible might of the Soviet Armed Forces." These simple and clearly understandable words express the thoughts and aspirations of every Soviet citizen.

"When you read these lines," one of the subunit veterans said to me, "it is as if you realize anew what enormous responsibility each of us bears for the fate of world peace."

Aviation personnel are well aware of the alarming world situation. The competition slogan "Be alert, constantly ready to defend the achievements of socialism!" has become a call of the heart for every serviceman. The squadron

excellent missile proficiency. In the new training year pilots, engineers, technicians, and junior aviation specialists are making every effort further to build upon their military achievements.

3024
CSO: 9144/347

PILOT CADET CRASH-LANDS AFTER BIRD STRIKE

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) p 30

[Article, published under the heading "Military Educational Institution Affairs," by Lt Col (Res) L. Mazyrin: "Composure Saved the Day"]

[Text] Pilot cadet Yuriy Barilenko was about to proceed to the practice area to work on complex piloting techniques. Following procedure, he carefully inspected his aircraft and climbed into the cockpit. He fired up the engine. Radioing the tower, he taxied smoothly out to the active.

"This is 41. Flight plan approved. Takeoff, practice area...."

"41 cleared for takeoff."

Barilenko started the stopwatch, released the brakes, and the aircraft proceeded to roll. The instruments indicated all functions normal. The L-29 lifted off and commenced climbout. When the pilot cadet retracted the gear, he suddenly felt a strong jolt. A bang resounded, and the engine died. The aircraft was only a few dozen meters from the ground. He had to make an immediate decision....

"Bird strike. Engine stopped," Yuriy immediately informed the tower.

The young pilot did not lose his composure in this difficult situation. Every time he was readying to go up, Barilenko would meticulously mentally rehearse emergency procedures. This certainly came in handy now!

"Switch off engine, close emergency fuel shutoff valve! Land straight ahead," prompted flight operations officer Maj N. Pokandyuk.

The pilot cadet closed the cutoff valve and pushed the emergency fuel shutoff valve button. His mind was functioning with precision. He could not land the aircraft straight ahead: concrete post obstacles were in the way. He had to turn. Sensing that the aircraft was responsive, Barilenko made a shallow bank left. As the aircraft descended, its nose was steadily drifting further from the posts. Airspeed was.... A suitable spot to put down appeared out ahead. Raising a cloud of dust, the aircraft slid along the ground on its fuselage,

turning somewhat as it slid. Yuriy opened the canopy, freed himself from the restraining straps, and jumped down onto the ground. Having come face to face with danger, the young pilot had successfully passed a serious test. It was a victory for his skill, self-mastery, volition, and composure.

"Of course I was nervous," Yuriy later admitted.

Barilenko had dreamed of becoming a pilot since childhood. He had attended secondary school in Voroshilovgrad, had gone out for sports, liked technical subjects, and very much liked reading books about aviators.

"I saw the film 'Only Old Men Go Into Battle' several times," he related. "The intrepid pilots, their firm friendship with their ground crews, and bold clashes in the air with the fascists were thrilling."

Yuriy is proud of the fact that he is a pilot cadet at the Order of Lenin Yeysk Higher Military Aviation School for Pilots imeni Twice Hero of the Soviet Union Pilot-Cosmonaut USSR V. M. Komarov, which has fine traditions. He studies flying with great diligence. He studies in detail the complex construction of aircraft, practical aerodynamics and combat employment of aircraft, and he endeavors to gain a thorough understanding of every item. When preparing to go up in the air, he thinks through his actions in detail, in order to handle the aircraft properly in various situations. Pilot-instructor Lt V. Idemenev says the following about him: "Barilenko is very persistent in working toward a goal. He works a great deal to improve himself and studies assiduously, with enthusiasm. He intelligently analyzes his mistakes and rapidly corrects them. He was one of the first in the squadron to solo. He has solid skills in piloting technique. He is cool, composed, and possesses psychological fortitude. I also like the fact that he is sociable and responsive. He is my number one assistant...."

Barilenko helps his comrades in their studies -- Sergey Kruglyy and Valeriy Chikalov. He himself has received high grades on the flight training program and completed the first year of study with a grade of excellent. He has received several commendations for zeal in performance of duty.

A member of the military council -- chief of the political directorate of the Red-Banner North Caucasus Military District -- cited pilot cadet Yu. Barilenko for bold and resolute actions in a critical situation and wished him additional success in mastering the difficult combat profession. This future pilot is filled with desire to study even better, in order to carry out in an exemplary manner his duty as defender of the homeland.

3024
CSO: 9144/347

AIRFIELD GROUND VEHICLE DRIVERS LEARN DISCIPLINE, GOOD PRACTICES

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) p 31

[Article, published under the heading "They Support Flight Operations," by Lt Col A. Tkachenko: "Drivers on the Airfield"]

[Text] The fighter taxied to the ramp. Scarcely had the pilot shut down his engines when fuel tanker and air supply trucks drove up to the aircraft, soon followed by an oxygen resupply vehicle. Capt A. Amelin, duty officer for flight operations airfield technical support, asked Capt Tech Serv V. Strigin if he needed anything else to ready the aircraft for another sortie.

"If we could get the ordnance over here faster. The aircrew will be heading for the weapons range on the next sortie," replied Strigin.

Amelin made a note on his pad and immediately issued appropriate instructions to the tractor drivers.

It only took Capt V. Dulin's men a few minutes to service the fighter. They quickly fueled it, topped off compressed and liquefied gases, helped the ground maintenance technician and mechanics check the radio equipment, electronic gear, and armament. Soon the fighter was back in the air. The aircrew successfully accomplished its scheduled training activities during this flight operations shift. The smooth job done by the drivers of the vanguard company was also noted at the flight operations debriefing.

For several years now there have been no ground vehicle accidents or near-mishaps at this field. At a recently held technical conference Capt V. Dulin's men were once again named among the socialist competition winners. Many officers and warrant officers were cited by the senior commander.

This recent period of training was heavily work-loaded both for aircrews and for their ground supporters. Vehicle drivers frequently had to service flight operations on two shifts, often day and night. They were subjected to heavy physical and psychological stresses. Considerable effort and a high degree of skill were also required of the company's maintenance specialists during the period of ground vehicle servicing and maintenance and performance of routine

maintenance procedures on special equipment. The men constantly concerned themselves with maintaining the equipment in exemplary condition.

Innovatively analyzing amassed experience in specialized ground vehicle operation and maintenance, the drivers build upon achieved successes, frankly and honestly evaluate mistakes, and endeavor not to commit breaches of military discipline.

Once Pvt S. Zubov failed to follow the prescribed vehicle route on the airfield. Desiring to gain time, he drove off the pavement, and of course subsequently tracked mud on the concrete surface. On another occasion he and Pvt M. Yurasov crossed the active runway without clearance from the tower. On occasion drivers would drive with excessive speed, and vehicles would get too close to taxiing aircraft. Strict, firm action was taken in response to every violation, and the guilty parties were disciplined. Today the company commander, the subunit party and Komsomol organizations consider disciplinary infractions to be a result of gaps in indoctrination work with personnel. Now they are much more demanding on the drivers in the subunit, they are exacting in evaluating readiness of vehicles to leave the truck park area, and they make sure that drivers are thoroughly familiar with airfield ground vehicle routes and operating regulations.

Considerable attention in this outfit is devoted to dissemination and adoption of the know-how of the top personnel. In a special operational news sheet issue, for example, Komsomol activists discussed the job performance of squad leader Jr Sgt P. Nekhta and his method of performing seasonal truck maintenance procedures. Komsomol member P. Nekhta keeps a close eye on the condition of the equipment assigned to him, promptly and conscientiously checks to ensure that cables, lines and hoses have solid connections and that items are firmly secured to the truck frame and body. Such an inspection makes it possible to avoid intermittent contacts and sparking. Following officers' instructions, the driver performs efficient preventive maintenance. Junior Sergeant Nekhta displays intelligent initiative. Spotting blackening on a generator, for example, without waiting for additional instructions, he cleaned the commutator with a clean rag and a special fluid, after which he dried off the generator with compressed air. In addition, he endeavored to establish the reason for certain parts becoming fouled, lubricated the bearings, and inspected the brushes. Thanks to such care, an airfield vehicle has never let this driver down. And the majority of the men in this excellent-rated company are of the same caliber.

The company commander and his deputies analyze flight operations shift support in a substantive and instructive manner, taking note of those who rigidly adhere to the provisions of the document governing military vehicle driver procedures, for the rhythm and safety of flight operations can be affected by even insignificant errors of omission, such as leaving a vehicle unattended, careless removal of stones or mud from vehicle tires, incorrect adjustment of wheel toe-in and headlights. At one airfield, for example, the driver of a ground power unit failed to chock his wheels, and the vehicle suddenly commenced to roll, damaging the aircraft's wingtip.

In Captain Dulin's subunit all measures are taken to prevent such occurrences. In particular, this is fostered by regular training and verification. Officers and warrant officers explain to their men the significance of the physical processes taking place during adjustment operations, maintenance and repair procedures, such as when adjusting brakes, ignition systems, and engine response, on which vehicle "survivability" depends. They insist that maintenance specialists perform servicing procedures on truck components not by eye but with test equipment and special instrumentation. Knowledge of the equipment helps the men detect a malfunction on the basis of the first warning sign, and it helps them independently get a vehicle operating if a breakdown does occur.

On days when there are no flight operations, the subunit leaders hold training drills. Drivers rehearse driving up to an aircraft, carrying out ground technician orders during hours of darkness, and driving around the airfield with an eye toward achieving maximum fuel savings, minimum engine operation, and maximum tire life. It is for good reason that Captain Dulin's company is one of the district leaders in the military truck driver competition for economy and thrift.

3024
CSO: 9144/347

VIRTUES OF COMPETITION AMONG MAINTENANCE PERSONNEL PRAISED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) pp 32-33

[Interview, published under the heading "Know-How of the Best Into the Combat Arsenal," with Engr-Lt Col L. Kulikov, regiment deputy commander for aviation engineer service, by AVIATSIYA I KOSMONAVTIKA correspondent Lt Col G. Spiridonov: " Aviation Engineer Service Specialists Compete"]

[Text] During a routine totaling of combat training and socialist competition results in the helicopter regiment in which Engr-Lt Col L. Kulikov serves as deputy commander for aviation engineer service, it was noted that in spite of the inclement weather characterizing the last months of the first training period, many crews had advanced their mastery of combat skills. The competition winners for the previous month included the crew led by Maj V. Lyubimtsev, the airframe and powerplant maintenance group headed by Lt Tech Serv K. Oleshkevich, flight technician WO V. Rodionov, and mechanic WO V. Ivanov. They were given challenge pennants and prizes in a formal awards ceremony.

At the same time criticism was leveled at those who were not working at full effort.

AVIATSIYA I KOSMONAVTIKA correspondent Lt Col G. Spiridonov asked officer L. Kulikov to relate how aviation engineer service personnel met their pledges during the winter training period.

[Question] Leonid Yakovlevich, the summer training period is approaching fast, that time of year which is most critical for aviation personnel. What in your view was characteristic in the first half year, and what performance levels did your men achieve?

[Answer] We have not yet totaled up in detail the performance results of the winter months. Winners will be determined on the basis of specific figures pertaining to meeting socialist pledges, and the best military collectives will be designated. But achievements have unquestionably been made. Aviation personnel are completing the first training period with new successes in

intensive military labor. Analyzing these successes, I cannot help but recall my own first steps.

I was assigned to this helicopter regiment upon graduating from service school and was designated squadron deputy commander, and subsequently regiment deputy commander for aviation engineer service. I am proud of the fact that my men, just as other personnel, are further building upon the unit's fine fighting traditions. The outfit has honorably retained the rank of excellent for several years in a row now. Engineers, technicians, and mechanics are reliable assistants to our pilots. They participate together with the pilots in accomplishing such difficult and crucial missions as hauling personnel and supplies, and providing support to tactical air exercises. Officers Fadeyev, Kalin, Nikitin, and others have been decorated for courage, outstanding skill and ingenuity. Aviation engineer service personnel have amassed experience in helicopter operation without equipment breakdowns and air mishaps. While on extended assignment away from base, personnel have performed just as smoothly as at their own home field.

Therefore last year as well we had no doubt that we would maintain our leadership position in competition among the aviation units of our decorated districts. But such was not the case. During an inspection a team from higher headquarters found a number of deficiencies in the subunits, as a result of which the grade on the principal performance categories was lowered. It is true that the regiment was still one of the well-trained and prepared units, but it lost its rank of excellent.

I shall state quite frankly that this hurt the men's pride. But gradually emotions were replaced by cool deliberation and firm exactingness. We were taking a new look, as it were, at the state of affairs in the outfit and were endeavoring critically to assess our shortcomings and thoroughly to analyze our miscalculations. At work meetings, party and Komsomol gatherings officers admitted that in comparison with the previous year the intensity of competitiveness in combat training had diminished. In fact, the speakers noted, quantitative indices in the regiment were not bad overall. Evidently for this reason some pilots had been less demanding on themselves. Excessive attention to form with detriment to content, as well as unnecessary relaxation of demands sometimes occurred when flying training missions and meeting performance standards. The commanding officer took away the rating of excellent from officers Suvorov, Zabelin, and Braychenko for these errors of omission in their training.

Totaling up of performance results was sometimes done without thorough analysis, and they were slow about adopting advanced know-how. Therefore these measures failed to exert mobilizing influence on people. Some party members, seeing deficiencies, failed to respond adequately.

The results of such an attitude toward things were soon in evidence. Once the crew of the helicopter on which Captain Agafonov is navigator and Captain Technical Service Slivets is flight technician took off on a mission... without turning on the rotating beacon, which could have brought aircraft dangerously close to one another in the air. We took preventive measures, and the guilty parties were disciplined. We also communicated to personnel the

reason for the mishap-inviting situation -- lack of coordination between actions by navigator and flight technician. But some time later a near-mishap situation was once again created, this time not by rank-and-file aircrew but by flight commander Captain Dzhaksbayev and his instructor -- they forgot to switch on the flight recorder. Of course competition points were docked for the entire subunit due to these errors.

It is to the credit of the helicopter crewmen that they set about seriously to correct their mistakes, in order to regain their slipped position and fully to meet their pledges. And although we have not yet regained the title of excellent performers, we have achieved pretty fair results.

We considered our adverse performance when discussing the performance level achieved by the competition initiators in the Air Forces -- the men of the regiment under the command of Guards Lieutenant Colonel Temnikov. Carefully weighing our capabilities, among other pledges we pledged to earn the regiment a rating of excellent. In addition, we pledged to produce two excellent-rated subunits, make 72 percent of our aircrews excellent-rated, have 90 percent of our specialists proficiency-rated, with no fewer than half earning the master proficiency rating and the specialist 1st class rating. We resolved to shorten by 5 percent the time required to make equipment combat-ready by mastering related occupational specialties, by palletization and containerization, and by improving scientific organization of labor.

If we analyze preliminary competition totals for the past months of winter training, it becomes clear that pilots and aviation specialsits are working hard. Tasks are being successfully accomplished, in particular by the service school graduates. Many of them are now performing helicopter maintenance at the level of a specialist 2nd class. All technicians, regardless of MOS, have mastered the techniques of mounting and removing helicopter armament and have learned to install storage batteries in the battery compartments, which is very important when responding to the signal to assemble.

The men have begun showing a more exacting attitude toward performance of their job duties, and work supervisors have increased demandingness on their men. This alone has resulted in an appreciable improvement in discipline. Activists are regularly disseminating and helping commanders adopt the know-how of vanguard technicians, such as master proficiency-rated Captain Technical Service Petrov, for example. He has logged more than 3,000 hours without any adverse marks, and he has trained a great many highly proficiency-rated specialists. These include party members technicians Shlyayev, Nikitin, and Kol'tsov, who have succeeded in a short period of time in bringing their helicopters right up to snuff. And the most outstanding performers in our outfit are awarded a challenge pennant. Warrant officer Rodionov recently earned this honor: his helicopter has logged the greatest number of hours in the squadron, and in addition he prevented an equipment breakdown by displaying vigilance during night flight operations.

[Question] Please tell us what criteria you used as a guide in determining competition winners.

[Answer] The main items for us have always been flight technician hours logged, and ensuring failure-free aircraft operation, with no disruptions to the flight operations schedule. We would also take into account the flight technician's contribution toward training both aircrew members and junior aviation specialists. Naturally in determining place we also take into consideration the degree of activeness of an engineer or technician in efficiency innovation and invention activities, in squadron volunteer activities, his role in strengthening military discipline, and exemplary performance in independent study.

As I have already noted, the specific features of subunit work performance consist in the fact that aircrews frequently must perform flight assignments away from their outfit, temporarily based at remote locations. Subunit leaders would sometimes have difficulty evaluating the work performance of their men, their discipline, and in comparing the performance results of two competing technicians or flights.

Experience has suggested how this problem is best solved. Very helpful is a detailed analysis of technical documentation by aviation engineer service leader personnel, as well as study of reports by subordinates, and conversations during combined helicopter inspections by regimental engineers and during the holding of training drills, when the smoothness of work performance by an entire crew is being checked. If a specialist has not been sent away on a temporary duty assignment to increase his knowledge, he naturally might lose in part his job skills. Following the return of specialists, we regularly arrange to have the aviators speak to personnel. They relate what they have succeeded in achieving in carrying out their duty assignments. Such talks are of a frank and open nature. We also view self-testing as one of the determining criteria in totaling up competition results.

Of course all this does not exclude other well-proven forms of verification. Regardless of appreciable successes in his work, a specialist will not become a leader if he departs from the requirements of regulations, appears at the airfield in nonregulation clothing, and violates the daily routine.

Once, for example, on the instructions of Captain Technical Service Petrov, a mechanic cleaned up the helicopter interior and removed accumulated moisture from the main and tail rotor assemblies. But in place of thanks, the junior specialist had to hear a reprimand: he had neglected certain safety precautions, which was contrary to standard operating procedure and the requirements of guideline documents.

[Question] Apparently you also have your difficulties alongside achievements?

[Answer] Of course. People are only human, with their virtues and shortcomings. We have aviation personnel who have not fully grasped their responsibility for living up to the great responsibilities of the aviation engineer service specialist. There are also those who fail to display creative initiative in aircraft servicing and maintenance. We keep an eye on them. But they are only isolated individuals. The great majority of the men are studying and competing at full effort.

Frankly, we could have had even greater success if we had succeeded in more fully resolving the problem of ensuring publicity and adoption of advanced know-how. Sometimes a paradox occurs: two technicians are competing with one another, and yet they are not aware of one another's achievements. Aviation engineer service leader personnel do not always delve deeply into the reasons for performance lagging by a given maintenance specialist, and in totaling up competition results they fail to point out the end goal of the competition: strengthening of combat readiness and flight operations safety, not a chase after performance numbers.

We have not completely eliminated unnecessary situation simplification and relaxation of demands. I recall a recent tactical air exercise. It seemed that the men were accomplishing all missions rather well, but the umpires did make some adverse comments. Some technicians failed to check over their gear prior to night flight operations, failed to replace their flashlight batteries, and failed fully to pack their personal gear bags, and yet they could have thought of these "trivial items" and avoided performance markdowns.

[Question] Leonid Yakovlevich, could you tell us about any innovations in the engineer-technician personnel competition?

[Answer] That is no easy question. There are many different forms in competition. Appropriate documents and recommendations proven through practical experience on how to organize it. And if these requirements are truly met, as experience shows, results will be excellent.

Let us say, for example, that a technician pledges to achieve savings in fuel and lubricants. We have ratified fuel and lubricant standard consumption figures, and the manner and procedure of their storage and secondary utilization has been specified. What can you invent here? It is another thing altogether to prevent overconsumption through the fault of personnel. This problem merits close attention on the part of every airman and requires further study. Particularly since matters pertaining to proficiency, discipline, and improving the skills of technicians and mechanics are very closely linked to it. There is also soil here for creative quest by our efficiency innovators.

The main thing is not to reject the advanced and progressive. In particular, good results are produced by cross-inspection of helicopters by flight technicians who are in competition with each other. They themselves make a preliminary determination on who of them is in the lead, rather than a subunit aviation engineer service supervisor, whose job it is to rate his men's work performance. You will agree that you will not feel that great if not only your immediate superior but your competition partner as well reproaches you for any mistakes or need for corrective work. This is why aviation specialists prepare for cross-inspections just as painstakingly as for combined inspections conducted by regimental engineers.

Many of our technicians resolved to perform at the level of specialists 1st class. But this presupposes mastery of skills in preventing defects and system failures. Is it possible to ensure competitiveness here? Of course it is. Defective parts are installed in training simulators, engines and

equipment which have been retired from service, prior to the commencement of training classes, on the instructions of the appropriate supervisors. What is the purpose of this? First and foremost to teach officers quickly to spot and correct malfunctions.

Here is an example. The young maintenance technicians did not have a clear picture of what cracks look like on exhaust nozzle connections. But when they were shown barely noticeable traces of soot on the outside of the pipe and reminded how to protect powerplant assemblies from breakdown, the maintenance specialists proceeded to work with considerably greater confidence.

Nor did we always consider the psychological aspect of competition. At times we would be surprised: during practice drills an officer performs with a good time and with assurance in replacing armament configurations, while during a tactical air exercise he does a poorer job. One could see he lacked skills in working with live ordnance. When we went over with the men the specific features of unit operation and maintenance, procedure of loading machineguns and mounting bombs, and rehearsed safety procedures, results improved. Now we have begun devoting greater attention to practice drills with live rather than just dummy munitions.

Toward this same objective our engineers frequently schedule practice drills on the helicopters in adverse weather conditions. The young maintenance technicians compete in replacing "damaged" components located in the upper part of the cargo space, clean filters, and even take down and install main rotor blades under instructor supervision.

We have devised methods of quickly bringing back on-line maintenance technicians who were out for an extended period of time due to illness or leave.

Every time we total up performance results, command personnel take into consideration an endeavor by the men to improve results and meet pledges ahead of schedule. Moral incentives are extensively employed: specific-topic issues of operational news sheets, photo newspapers devoted to vanguard performers, local radio broadcasts, and award of prizes, certificates and pennants.

Personnel are also guided in their work by the recommendations contained in the proceedings of the December (1983) and February (1984) CPSU Central Committee plenums. In particular, by the statement that our successes will depend to a decisive degree on mobilization of the masses, on people's innovative attitude toward the assigned task, and on further development of socialist competition.

3024
CSO: 9144/347

DEVICE FOR KEEPING RUNWAY CLEAR OF BIRDS DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) pp 36-37

[Article, published under the heading "Constant Attention to Flight Safety," by Engr Lt-Col A. Reznichenko and Soviet Army civilian employee V. Baluyev: "Repelling Devices Frighten Birds"]

[Text] The fighter had lifted off and was climbing out steeply. Eyes stared admiringly at the attractive, fast-moving aircraft. Suddenly the afterburner thunder died out. The aircraft pitched down and rushed groundward. The pilot's voice rang from the speakers in the tower: "Birds.... I hit a flock of birds. Engine out...."

The pilot did not eject, nor could he have ejected -- there were people below. Displaying coolness and composure, he managed to clear the buildings and slide into a wheels-up landing.

Some time later we were looking at what remained of the beauty and speed. One of the officers said, with pain in his voice: "A fine aircraft, and brought down by a sparrow...." He was speaking figuratively, but it was not far from the truth. Jackdaws, sucked into the air intake, demolished the compressor blades, and the engine failed.

This incident, which occurred many years ago, comes to mind every time we hear about an aircraft colliding with birds. Airborne feathered creatures present a serious hazard to an aircraft. When a bird strikes an aircraft flying at high speed, it pierces the skin with the force of a projectile and smashes through high-strength alloy steels.

For many years now experts have been seeking effective methods of protecting airfields from bird flocks. Analysis indicated that the majority of bird strikes took place in the vicinity of airfields. Therefore measures under development have been directed toward creating conditions around airports which would help keep birds away. Toward this end researchers are seeking to determine the factors which attract birds and to create an airport environment which is ecologically unfavorable for birds. Attempts to eliminate the factors causing increased concentration of birds in the vicinity of active runways are only initially successful.

Acoustic (bioacoustic), chemical and physical methods of frightening away birds are presently in widespread use in many countries. While chemical methods affect chiefly the senses of taste and touch, acoustic and physical methods affect hearing and vision, which, as we know, are the most highly developed senses in birds. Affecting these organs with light and sound stimuli, one can effectively frighten away birds.

A substantial portion of bird-scattering devices work on auditory perception. They include all types of explosive devices, which periodically produce a loud gun report. Carbide and gas cannons are the most widely employed. But they are effective bird-frightening devices only for the first two or three weeks. Subsequently birds become so accustomed to the "shots" that they proceed to perch right on the devices. It is true that birds abandon a dangerous area if they are regularly shot at. But extermination is not an appropriate method. One must also be concerned with the ecological environmewnt. Observations indicate that since birds sooner or later become accustomed to the majority of deterrent devices, these devices must regularly be replaced with new ones.

For a period of 2 years we conducted experiments involving frightening away birds with various types of rocket flares. SKhT (Chemical Attack Warning) signal flare rockets proved to be more effective than other devices. The fact is that both light and sound stimuli act on birds from the moment the signal flare rocket is fired until it is fully extinguished. A flash occurs at the moment it is fired, followed by a loud report, and the signal flare rocket surges skyward. It bursts at the highest point of its trajectory, breaking up into several parts. As they fall, these elements produce a loud, protracted noise, which acts as an additional irritant.

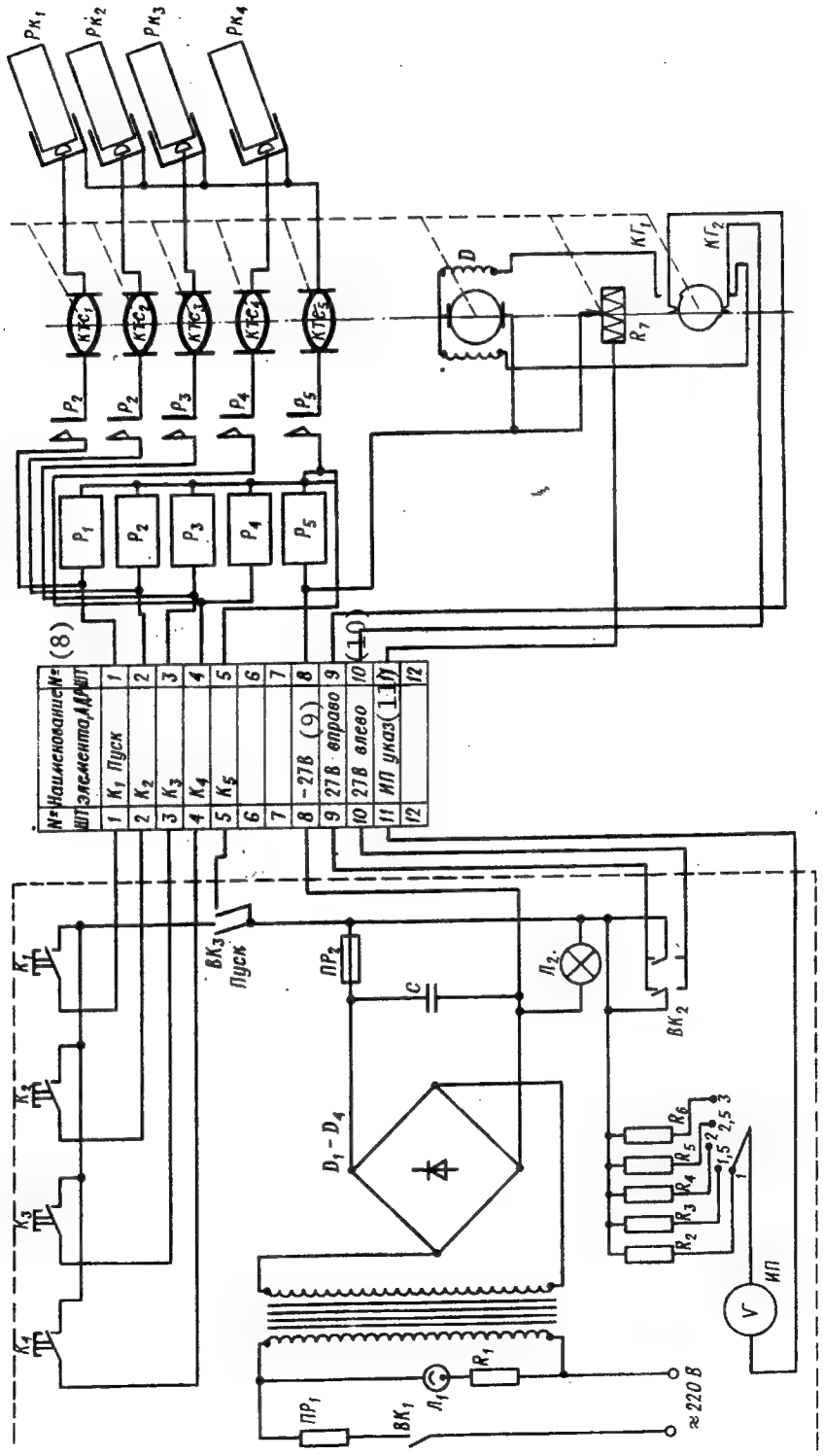
Specialists at our weather briefing office designed an automatic device to frighten away birds from an airfield (AUOP), which employs SKhT signal flare rockets. In view of their specific features as well as the fact that they are electrically ignited, the unit was installed on aircraft takeoff and landing paths. It is remote-controlled from a panel at an air traffic control position in the tower. Upon receiving a report, based on visual and radar observations, of the presence of birds which may present a hazard in the vicinity of the active runway, the tower controller can turn the rocket flare firing dispenser in the proper direction and fire flares: one, two, and as many as four if necessary.

The unit consists of a metal case, a dispenser for the rocket flares, a reversible electric motor (EDR) with power supply, and a remote control panel.

The metal case can be cylindrical or square. The case is fitted with a hermetically-closing top in order to keep moisture from the interior mechanism and signal flares. The flare dispenser is made of an insulating material and is coaxially connected to the reversible electric motor. The firing system operates on 12 volts through a slip-ring drive.

The reversible electric motor with power supply turns the flare dispensers 180 degrees in either direction. Limit switches are employed to interlock the system. The flare firing control system is based on RKN (RES-9)

Schematic Diagram of AUOP-4 Bird-Scattering Unit



Наимен. и №дет.	Наименование и тип деталей
R_1	Сопротивление МЛТ 36к 0,25 В
R_2	(2) МЛТ R * 0,25
R_3	МЛТ R * 0,25
R_4	МЛТ R * 0,25
R_5	МЛТ R * 0,25
R_6	МЛТ R * 0,25
R_7	ППС 10
C	МБГП-2 40×50В
$ПР_1$	ПК 45-10
$ПР_2$	ПК 45-10
$ВК$	$Т_3$ ВРО 3600 ТТУ
$КГ_{1-2}$	Пер D 701(D703)
D_1-D_4	D-231А
$Л_1$	ТН-02
$Л_2$	МН-26-012
P_1-P_5	PCS.680.003
$КТС_{1-5}$	Токосъемные кольца (3)
$ВК_2$	ТП-1-2
$К_{1-5}$	КМ-1-101-00.360.011 ТУ
$ПК$	2ППН-11
$ТР$	Трансформ. сил. пон.(4)
D	Двигатель реверсионного типа(5)
$ШР$	Разъем тип ГОСТ (6)
$ВК_3$	ТП-1-2
$ИП$	
	Ракета СХТ-40 (7)

(1)

Key to diagram:

1. Designation and type of component; 2. Resistor; 3. Slip rings; 4. Step-down power transformer; 5. Reversible motor; 6. GOST connector; 7. SKhT-40 signal flare rocket; 8. Element designation; 9. Right; 10. Left; 11. Marker

---

electromagnetic relays. The relays are powered by 27 volts. The power supply contains a 220-27-12 volt step-down transformer with D231 and S semiconductor diode rectifier. The remote control panel contains signal flare rocket firing buttons (KP-1, KP-2) and a dispenser rotation angle gauge (IUP-1) with switches (VK-1, VK-2). A code PRPPM 2 x 1.2 (2.5) cable should be used to connect to the unit.

Operation of this unit to frighten off birds on and around an airfield indicated a high degree of effectiveness of physical (pyrotechnic) scattering devices. Rooks, jackdaws, crows, starlings, gulls, and storks abandon the vicinity of the active runway following the first rocket flare firing. Repeat use is required in rare instances and only for local birds. As a scattering device, the SKhT signal flare rocket constitutes a very strong stimulus for practically all bird species. We believe that the small expenditures involved

in making one of these units will be repaid a hundredfold, and this device will effectively guarantee safety from ground-adjacent bird strikes.

3024
CSO: 9144/347

WAYS TO SAVE AVIATION FUEL ANALYZED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) pp 38-39

[Article, published under the heading "The Reader Suggests," by Engr-Maj Gen A. Subbotin, Engr-Col B. Bedrik, and Engr-Maj P. Agapov: "Reserve Potential For Saving Fuel"]

[Text] Our country possesses immense fuel and energy potential and is the only country in the world in which development of the national economy is based on its own domestic raw material resources. We cannot, however, ignore the worldwide energy resource short-supply problem caused by a steady increase in fuel consumption volume. The world fuel and energy problem has assumed military-political significance and has sparked imperialist conspiracies and military conflicts. These and other factors dictate the necessity of economical utilization of Soviet fuel and energy potential as one of the most important factors in the strength and might of our socialist state.

The Communist Party and Soviet Government constantly devote attention to the problem of economical utilization of fuel and energy. Appropriate orders have assigned our military personnel specific tasks pertaining to efficient utilization of and savings in fuel and energy.

Year after year the personnel of vanguard units and subunits achieve success in accomplishing these tasks of national importance. In particular, leader personnel of the Air Forces Aviation Engineer Service are performing considerable analysis directed toward reducing routine expenditures of fuel in readying aircraft for sorties, in ground-maneuvering aircraft, in flying sorties, and in air traffic control.

Success in this important undertaking is also promoted by the fact that in planning flight operations command personnel take fuel economy measures into account and endeavor to combine training exercises for aircrews with full-tank refueling. Experience indicates that in order to determine optimal aircraft fuelings, it is advisable to perform engineer-navigator calculations of fuel required for a sortie on the basis of training activities to be performed. This eliminates excessive fuel consumption, especially in aircraft servicing and maintenance modes.

Fuel savings can also be achieved by intelligent preparation of aircraft for sorties, such as, for example, by thoroughly considering the selection of external stores requisite for the sortie, as well as by ensuring optimal airframe configuration. Unfortunately some aviation engineer service specialists forget that such "trivial items" as failure properly to close and seal access covers, a dirty fuselage and wing surface, an uneven aircraft paint job, and error in test instrument readings lead to increased fuel consumption. As is reported in the foreign press, for example, a one degree error in adjusting the rudder on a Boeing 747 results in annual fuel overconsumption of 488 tons while a 0.01 M error in calibrating a Mach meter leads to an annual fuel loss of 1,430 tons per aircraft. Here is another example: reducing aircraft drag 1 percent by regularly cleaning the exterior surface and preventing turbulence around the exterior doors produces annual savings of 650 tons of fuel per aircraft.

We have time and again witnessed the following: an aircraft taxies into position and holds, and then is forced to stand an unwarrantedly long time waiting for takeoff clearance. A simple calculation indicated that a large amount of fuel is wasted in such instances. Fuel consumption can be reduced by determining fighter optimal waiting time for takeoff, taking into account airfield taxi conditions.

There are also other ways to reduce additional fuel consumption. After landing, for example, a multiengine aircraft should taxi with the least possible number of engines running. It has been determined that 5 minutes of taxiing following landing by a two-engine aircraft with one engine running results in fuel savings of 115 kg.

Fuel consumption on ground maneuvering an aircraft depends in large meausre on aircrew proficiency, proper selection of powerplant operating conditions during taxiing, observance of the requisite speed, spacing between aircraft, and rectilinearity of path of movement. Other important factors include the condition of the airfield paved surface, whether the situation permits uninterrupted aircraft movement control, as well as quality and duration of inspection at the technical inspection station.

Fuel and lubricants can also be economized in the process of washing and testing parts and assemblies, airframe and engine systems, and by cleaning and reusing fuels and lubricants. Considerable savings are also obtained by employing MS-8, Labomid-203, ML-52 and other inexpensive synthetic detergents.

But the principal methods are those which ensure savings during performance of training sorties, when the bulk of the fuel is consumed: selection of economically advantageous altitudes, intelligent powerplant operation, and selection of optimal airspace utilization conditions. And a proper job is being done by those aviation commanders who regularly remind their men about this. In particular, it is economically warranted to climb out to cruise altitude in two or three stages on a long flight. For example, climbout for an aircraft with a 16 degree wing sweep, between altitudes of 1,000 and 9,000 meters, at an airspeed of 700 km/h, with engine at less than full power and without afterburners (n=92-84%) is the most economical. In addition, powerplant operational reliability and flight safety are enhanced.

Frequently when flying a training sortie an aircrew will exceed the specified time by 2 or 3 minutes. This would seem to be insignificant, but up to 2.5 tons of fuel will be consumed on 15 such sorties by a highly-maneuverable aircraft.

Fuel consumption on long cross-country flights can be reduced by linear stacking, when an aircraft's speed is adjusted in such a manner that it does not have to wait long to enter the landing sequence. It has been calculated that an aircraft descent from an altitude of 2,440 meters with an optimal glide angle has saved thousands of tons of fuel per year at one of the airports of the Ministry of Civil Aviation.

In addition, engine operation in flight should be coordinated with the specific features of the training activity. It was determined, for example, that in the process of operation of the powerplant of aircraft flown by different pilots for maximum economy, average fuel consumption per minute varied from 18 to 30 percent (up to 18 kg of fuel per minute). With repeated performance of a single drill it can be determined with the aid of integral characteristics of engine operation conditions. After processing the flight recorder data, it is possible to recommend to the crew the conditions under which fuel consumption can be reduced without detriment to quality of sortie execution.

Skillful utilization of flight recorder information enables one to obtain statistical data on fuel consumption in conditions of aircraft operation. Analysis of these data have enabled us to ascertain complex relationships of variables, the most important of which are aircraft powerplant operating conditions evaluated on the basis of low-pressure rotor rpm n, ambient air temperature t_a, duration of maneuvering phase t_m, and time expended on testing aircraft powerplant t_{te}.

During takeoff and climbout, fuel consumption $q_{f.vs}$ is determined by aircraft takeoff weight G_t, indicated airspeed V_i, change in pressure altitude Delta H, powerplant operating conditions n, and the square of change in airspeed during climbout, $DeltaV^2$. Thus $q_{f.vs}=f$ (n; G_t; V_i; DeltaH; DeltaV; t_a). In addition, per-kilometer fuel consumption $q_{f.k}$ in level flight is significantly affected by flight level H_f, Mach number, and aircraft average weight at that altitude G_h, that is, $q_{f.k}=f$ (H_f; M; G_h).

Fuel consumption during the descent phase $q_{f.d}$ depends on duration of descent du_d), average rate of descent V_r, change in pressure altitude DeltaH, and to a lesser degree on aircraft weight on descent path G_d, that is, $q_{f.d}=f$ (V_r; DeltaH; G_d; tau_d).

During landing, fuel consumption is determined by an aggregate of factors, such as pattern height above ground, duration of flight in pattern, direction of landing approach, weather in the vicinity of the airfield, quality of air traffic control, and flight traffic intensity.

An important factor fostering savings in fuel and lubricants is a correctly established standard fuel consumption (ENR), which is a specified quantity

which determines consumption of fuel and lubricants in specific conditions, with mandatory observance of specified requirements.

At the present time specialists use for determining fuel ENR a statistical method (processing of report documentation on fuel consumption for a specified period of operation). Analysis of actual fuel consumption is performed from consumption records, monthly reports, and timing studies, taking into account the requirements of the appropriate instructions.

For example, standard fuel consumption amounts for aircraft operation in the air (ENR_a) and on the ground (ENR_g) are determined with the formulas $ENR_a=q_{f.d}/H^f$ and $ENR^g=q^{f.g}/H^g$ (kg/h), where $q^{f.a}$, $q^{f.g}$ -- total fuel consumption (kg) for a specified period of aircraft operation in the air and on the ground respectively; H^a, H^g -- total aircraft operation time in the air and on the ground respectively (h).

However, the existing method of determining fuel ENR practically ignores factors which affect fuel consumption. Therefore we have proposed and implemented a calculation-analytical method of determining ENR, whereby all principal factors affecting fuel and lubricant consumption standard figures are taken into consideration for all practical purposes.

Fuel consumption during airplane or helicopter operation on the ground and in the air is determined from data obtained by decoding SARPP-12 and TESTER-U3 flight recorder tapes. Fuel ENR was reduced for several types of aircraft on the basis of the calculation-analytical method.

Using the new method, standard fuel consumption on the ground is determined separately -- during aircraft taxiing, q^t, and during all types of powerplant testing, q^{te}. Fuel consumption on the ground is determined with the formula $q^{f.g}=(q^{ta} \times n^{ta}) + (q^{te} \times n^{te})$ (kg), where n^{ta}, n^{te} -- number of taxiings and testings during a specified period.

Total engine operation on the ground is determined with the formula $H^g=H^{ta} + H^{te.sq} + H^{te.tmu}$ (hours), where H^{ta}, $H^{te.sq}$, and $H^{te.tmu}$ are powerplant operation during taxiing, testing in the squadron and technical maintenance unit respectively.

On the basis of this, ENR^g is determined from actual figures on fuel consumption and powerplant operation.

Fuel ENR for aircraft routine servicing and maintenance ($ENR^{f.m}$) is determined per hundred hours of aircraft operation time and can be determined with the formula $ENR^{f.m}=q^{f.o}/H^g \times 100$ (kg/100 g), where $q^{f.m}$ -- fuel consumption for aircraft maintenance (kg).

Total fuel consumption during aircraft operation in the air is figured with the formula

$$q_{fa} = \sum_{i=1}^{n_a} \bar{q}_i \cdot n_a \quad (kg).$$

where q^i -- actual fuel consumption during performance of i=training activity; n^a -- total number of training sorties during a specified period of operation.

The economic effectiveness (E^e) from adoption of the new method of determining fuel ENR can be estimated with the formula E^e=nSigmaC x H (ENR^1-ENR^2) (rubles), where n -- fleet of aircraft of a specific type; C -- fuel cost (rubles/kg); H -- annual number of flight hours logged by aircraft of a given type; ENR^1, ENR^2 -- standard fuel consumption for aircraft, existing and new respectively (kg/h).

In our opinion consideration of all these data wil enable aviation commanders more successfully to accomplish a task of national importance -- economizing in and efficient utilization of fuel and lubricants.

3024
CSO: 9144/347

IMPORTANCE OF DISCIPLINE IN AIRCRAFT MAINTENANCE PROCEDURES EMPHASIZED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) pp 40-41

[Article by Engr-Lt Col V. Yershov: "Strengthening Discipline"]

[Text] Implementing the decisions of the 26th CPSU Congress and the decrees of the June and December (1983) CPSU Central Committee Plenums, and carrying out the orders of the USSR minister of defense and commander in chief of the Air Forces, the men of our Aviation Engineer Service are working persistently to achieve further increase in the combat readiness of subunits and are ensuring reliable aircraft operation and flight operations safety. This is fostered in large measure by diversified measures, including those directed toward strengthening process discipline [tekhnologicheskaya distsiplina], the role of which is steadily growing.

Vanguard engineers party members I. Pepik, V. Yegorov, V. Blinov, and O. Gorodnichev are working persistently to ensure precise observance of process discipline in their assigned areas. And flawless performance of job-related duties is particularly important for leader-Communists, for they are not simply observed but are learned from and emulated. These officer-leaders have concentrated their principal attention on improving the quality of all work activities performed by aviation engineer service personnel in readying combat aircraft. They are genuine organizers and initiators of adoption of new and advanced things. In their multifaceted activities they do not ignore man with his interests and aspirations, for the life of the aviation outfit, which is called upon through its military labor to ensure a high coefficient of aircraft reliability and continuous combat readiness, consists of what at first glance are ordinary, unremarkable, routine activities.

For example, an officer or warrant officer comes to the flight line in the morning and commences his work day. It is not a matter of indifference to an engineer whether he is provided with everything he needs in order successfully to accomplish the assigned task as well as the factors which may affect the quality of his work, for it is not enough to communicate to subordinates what work must be performed on aircraft in the course of the day. The main thing is to ensure smooth flow of process operations, a high degree of organization of labor on the part of all maintenance technicians and mechanics, as well as precise verification.

It is impossible to accomplish all this without firm discipline. And in my opinion a great deal here depends on the ability of the engineer-leader to establish proper relations with his men, to achieve flawless efficiency, to take note of the most outstanding performers in a prompt manner and to take more sternly to task those who are not putting out a full effort.

For several years I have been acquainted with Lt Tech Serv V. Chernysh. He is a knowledgeable specialist, a demanding and respected officer, who performs his job-related duties with a high degree of responsibility. Within a year after graduating from service school he had risen to the position of group chief, and after two years enrolled at the Air Force Engineering Academy imeni N. Ye. Zhukovskiy. An important role in his growth in service has been played by flawless efficiency and follow-through, and conscientious observance of all instructions and regulations. He has been greatly assisted by the unit's engineers and the squadron deputy commander for aviation engineer service.

Experience indicates that with increasing complexity of design and construction of aircraft, there is occurring not only a constant increase in the role of aviation engineer service leader personnel in training and indoctrination of personnel, but their responsibility for high-quality performance of work on aircraft is also increasing. For example, aviation engineer service officers, following the initiative of party member A. Demchenko, concerned with strengthening process discipline, innovatively approach organization and planning of all procedures to be performed on an aircraft during ground preparation.

Our engineers, for example, have developed operations schedules which are now extensively employed. Process operations, completeness and organization of inspection, and work-loading of all aviation engineer service specialists are figured in these schedules to the minute, and they specify the requisite number of specialists for performing a specific type of aircraft preparation (preliminary, preflight, after-mission, and others) according to the specified timetable. These schedules help aviation personnel utilize every working minute with maximum efficiency.

It is characteristic that daily work on the aircraft by the ground crew is also organized on the basis of operation schedules. Engineer-supervisors also perform operation-by-operation inspection according to such schedules. In addition, all jobs are performed by the squadron aviation engineer service specialists on the basis of task-cards. All this has made it possible to strengthen process discipline.

Concern with process discipline is not exhausted with this, however. Aviation engineer service supervisors are constantly monitoring the handling of process documentation by aviation engineer service specialists, the condition of tools and test equipment, as well as theoretical knowledge and skills.

Meriting attention is the experience of those supervisors who have put an end to excessive attention to form, with consequent detriment to content in aircraft maintenance, who rigorously observe the requirements of guideline documents and who are well acquainted with the state of affairs in the crews,

groups, and services: technical maintenance unit chief Maj Tech Serv N. Bondarenko, squadron deputy commander for aviation engineer service Engr-Maj N. Pospekhov, armament maintenance group chief Capt Tech Serv N. Khishko and others.

Those same officers who have not eliminated excessive attention to form and show frequently engage in bureaucratic administration in place of practical work organization and effective verification, and suffer failures. Such was the case, for example, in the aviation engineer service of the squadrons in which Maj Tech Serv A. Babenko and Engr-Capt G. Mishustin serve as deputy commander for aviation engineer service. There was a time when these outfits were tail-enders in socialist competition. There occurred serious violations of process discipline, due to which certain aircraft were not allowed into the air. Near-mishap situations also occurred. All this was a consequence of gross violations of the requirements of the uniform rules and regulations, deficiencies in indoctrination work, and inadequate personal exemplariness on the part of officers A. Babenko and G. Mishustin.

Unit officials thoroughly analyzed the work style of these engineers. They were shown the reasons for their errors of omission. The unit's best methods specialists helped them devise measures to correct shortcomings. Already changes for the better are in evidence. As was noted in the technician competition results summary, in recent months they have substantially improved organization of labor and have strengthened process discipline.

Meriting attention in this connection is the work experience of the officers of the aircraft equipment service headed by party member V. Yegorov. He personally drew up process cards on performance of routine maintenance and preflighting of instruments, oxygen equipment, and automatic electronic systems. Engr-Maj Yu. Yusupov devised process cards for electrical equipment. These officer-leaders also prepared a list of process and report documentation. In addition, we prepared and put to practical use an instruction pamphlet for group chiefs covering performance of aircraft maintenance procedures for the day, week, and month.

Officers V. Yegorov, Yu. Yusupov and others devote serious attention to analysis and prevention of malfunctions. Toward this end they make use of statistical data, flight recorder tapes, fault detectors, and inspect the condition of equipment. They have adopted as part of performance of maintenance procedures use of the oscilloscope in checking the most important systems: landing gear, fuel booster pumps, and aircraft tailplane control.

An important role in strengthening process discipline is played by the aircraft crew chief -- the aircraft's true proprietor. Most of our crew chiefs are hard-working officers of initiative. Sometimes, however, they lack experience in servicing and maintenance, training and indoctrination of subordinates. Therefore we periodically hold crew chief days. The agenda of items brought forth for discussion should include methods of conduct of work procedures in a crew in the process of readying aircraft and during flight operations proper, organization of operation-by-operation inspection in the crew, practical training of subordinates, plus others.

Process discipline is a mandatory condition for maintaining aircraft in a properly functioning, combat-ready state and for ensuring reliability of aircraft maintenance and combat employment as well as mishap-free flight operations. It is particularly important to consider this today, when the international situation has become sharply aggravated through the fault of the aggressive forces of imperialism, when demands pertaining to maintaining a high degree of vigilance and readiness to defend the achievements of socialism have increased immeasurably.

3024
CSO: 9144/347

SOVIET VENUS EXPLORATION PROGRAM REVIEWED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) pp 41-42

[Article, published under the heading "The Space Program Serving Science and the Economy," by Doctor of Physical-Mathematical Sciences Professor V. Moroz: "Venera Explores Venus"]

> [Text] Earth is one of the nine planets in the Solar System. Its climate, cloud cover, ice cover, ozone layer, magnetic field, ionosphere and magnetosphere, all conditions of life are connected with processes taking place in the Solar System. Therefore investigation of the planets is essential in order to understand what is taking place on Earth.
>
> Of the greatest interest are investigations of Venus and Mars, the closest planets to Earth and which are not greatly different from our planet in size and quantity of received solar energy.
>
> The following article discusses investigations of Venus with the aid of automatic interplanetary stations.

Soon after the first man-made Earth satellite was launched into orbit it became clear that it was time to think about unmanned missions to the moon and subsequently to the planets as well. Naturally Venus, the nearest planet, was the first on which an automatic interplanetary station (AMS) sent from Earth landed. This took place in 1967. It was designed and built under the supervision of chief designer Georgiy Nikolayevich Babakin.

The missions of this and other vehicles showed that the atmosphere and climate of Venus are not similar to the terrestrial atmosphere and climate. In particular, it was established that the Venusian atmosphere consists for the most part of carbon dioxide, although it does contain nitrogen as well (several percent). For the sake of comparison we shall recall that in the Earth's atmosphere the principal gases are nitrogen (80 percent) and oxygen (20 percent), with carbon dioxide comprising only 0.03 percent. This composition of the Venusian atmosphere also affected its mass. It is approximately 100 times that of the Earth's atmosphere. Correspondingly pressure at the planet's surface is 100 times that on Earth. The surface

temperature on Venus proved to be somewhat higher than that indicated by astronomical measurements from Earth, at about 460 degrees Celsius.

Thus about 10 years ago several basic facts pertaining to the properties of the Venusian atmosphere and climate were established thanks to investigations conducted with the aid of the first Venera craft. New tasks were added to the agenda. The main question was formulated as follows: why is it that the atmosphere and climate of Venus, which is similar to the Earth in its general planetary characteristics, differ so greatly from the Earth's? To date we have no precisely defined answer to this question. We must conduct detailed investigations, across a broad front, of the fine chemical composition of the atmosphere, including so-called minor constituents -- gases the content of which is measured in hundredths and thousandths of a percent, its optical properties, cloud structure, chemical composition of the soil, and structure of the planet surface.

Second-generation AMS, which possess a number of design peculiarities, were built for fine measurements of this type, requiring complicated equipment and transmission of large flows of information. Here, for example, is one of the features of its design. Several days prior to arrival, the AMS separates into two parts: the lander (SA) and orbiter (OA). The former plunges into the planet's atmosphere, while the motion of the latter depends on its assigned tasks and ballistic conditions. It can fly by Venus and become an artificial planet, or it can enter orbit as an artificial satellite of Venus, for which it fires an appropriate deceleration burn. In any case, however, the OA performs a very important function: it serves as a relay in transmitting radio signals to Earth. The SA can carry only a small antenna with limited directivity, and therefore direct transmission of information from the Venus lander to the distant Earth is not very effective. At the same time the Venus orbiter carries a highly-directional antenna for communications with Earth, used to relay lander radio signals. Reception of these signals by the orbiter does not present any particular difficulties, since the distance between the two vehicles does not exceed several tens of thousands of kilometers (three orders of magnitude closer than from Venus to Earth). The Soviet Venera 9 and 10 (1975), Venera 11 and 12 (1978), and Venera 13 and 14 (1982) stations operated on this arrangement.

At altitudes from 100 to 70 km, lander velocity decreases to approximately 300 m/s. A great deal of thermal energy is released during braking in the atmosphere, and the gas around the lander vehicle is at a temperature of about 10,000 degrees. To protect the vehicle against overheating, its skin is made of a special heat-resisting material. It consists of two hemispheres which are solidly connected and form a hermetically-sealed sphere until the vehicle has passed through the danger area. At an altitude of about 65 km the hemispheres separate and are jettisoned. A parachute system deploys. The lander descends by parachute to an altitude of 47-48 km. Further descent takes place without parachute. The vehicle is equipped with a round "wing" in order to improve its aerodynamic properties. Total time from deployment of the main parachute to touchdown is about an hour. Ultimately velocity decreases to 7-8 m/s. When the lander touches down on the planet surface, a shock-absorbing base ring softens the impact.

The scientific instrument package switches on simultaneously with deployment of the main parachute, with part operating during descent, and part after landing. The record for duration of data transmission from a Venus lander after touchdown was achieved by Venera 13 (2 hours 7 minutes).

Unique scientific results were obtained with the aid of second-generation Venera stations. Highly complex chemical analysis instruments (mass spectrometer, gas chromatograph, optical spectrometer, etc) detected and measured the content of 14 minor constituents in the Venusian atmosphere, including inert gases (neon, argon, krypton, xenon). Water vapor content was measured right down to the surface. It was ascertained that Venus is an extremely dry planet: it contains approximately 100,000 times less water than the Earth.

The Venera 13 and 14 landers were the first to measure the chemical composition of the planet's soil. It proved to be very similar to certain varieties of terrestrial basalts. The Venera 9, 10, 13, and 14 landers carried telephotometers -- instruments which obtained an optical panoramic image of the area around the landing sites. Flat stone blocks are typical elements of the terrain. They are reminiscent of the seabed.

The obtained panoramic images provide a detailed picture of a very small part of the planet. How can we obtain data on global topographic characteristics -- mountain ranges, low-lying plains, and valleys? This can be done only with radar. Only radio waves longer than several centimeters are capable of penetrating the atmosphere without attenuation and scattering.

Powerful radars based at terrestrial observatories have identified many interesting features on the surface of Venus -- enormous (perhaps volcanic) cones, semi-broken-down ring-shaped mountains, and valleys. But what if radar were placed on a man-made satellite orbiting Venus? Then we could differentiate surface details measuring 1-1.5 km. This is why the Soviet automatic interplanetary stations Venera 15 and Venera 16 carried side-scanning radar for detailed mapping of the planet. One should bear in mind, however, that the data provided by these satellites' radar are supplemented by data from a radio telescope designed to take passive measurements of Venus radio-frequency emissions, as well as an infrared spectrometer designed and built in the GDR. One of the main tasks performed with the aid of the infrared spectrometer is remote thermal sensing. In other words, the Venus radiation spectrum is used to measure the temperatures of the above-cloud atmosphere at different altitudes, latitudes and longitudes. On 10 October 1983 Venera 15 went into orbit around Venus, with Venera 16 entering orbit around Venus on 14 October. The orbits of both satellites are elliptical and greatly elongated. At the point closest to the planet they are at an altitude of approximately 1,000 kilometers above the surface. The pericenter of both orbits is located above the northern polar region, which had been totally uninvestigated prior to this time. Passage over the pericenter occurs once each day, each time producing a map, covering a strip approximately 100 km wide and about 6000 km long. Each day the orbital plane turns approximately one and a half degrees relative to the planet, as a consequence of its rotation, and a new strip is recorded.

The quality of radio-frequency images is very high: one can see hills, craters of various size, plateaus, mountain ranges, and gorges. Geologists can look forward to the large job of studying and interpreting the new world which has suddenly opened up to their gaze.

Now a few words about the infrared spectrometer. It is a highly complex and sophisticated electro-optical device, which has shown us for the first time the appearance of the infrared emission spectrum of the Venusian atmosphere in its various regions. Astrophysicists and meteorologists are finding as a result of analysis of this material a large quantity of new data on the Venusian atmosphere -- how much water vapor is contained in its clouds, at what altitude they are located, of what they consist, what is the temperature above them, and how atmospheric masses move. It was ascertained, for example, that there is a peculiar "hole" measuring several hundred kilometers in the north polar region; inside this "hole" the upper margin of the clouds is considerably lower than at medium latitudes. Evidently this is the center of a gigantic cyclonic vortex which encompasses the planet's entire northern hemisphere.

Thus study of Venus is continuing. The Venera 15 and Venera 16 missions are a new stride forward in investigation and exploration of space. Coordinated teamwork by many thousands of people stands behind each such stride forward. The designing and building of spacecraft, space communications and navigation -- all this has become a new technical discipline or, more precisely, an aggregate of technical disciplines, which could be called "technology of flight to other planets." At the same time a new aggregate of basic sciences is taking form on the foundation of astrophysics, geology, and geophysics -- planetary science. This mighty alliance between technology and science is just commencing to pick up momentum. We wish it a productive voyage into the 21st century.

3024
CSO: 9144/347

1983 SOVIET SATELLITE LAUNCHINGS LISTED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, Apr 84 (signed to press 6 Mar 84) pp 46-47

[Table of information with commentary: "Table of Spacecraft Launchings in the USSR in 1983"]
[Text]

(1) Дата запуска	(2) Название аппарата	(3) Начальный период обращения, мин	Высота орбиты (4) в апогее, (5) км	Высота орбиты (4) в перигее, км (6)	(7) Наклонение орбиты, град
12 января	«Космос-1428»	104,7	1017	972	82,9
19 января 8	«Космос-1429» — «Космос-1436»	115,3	1513	1449	74
20 января	«Космос-1437»	97,6	678	629	81,2
27 января 8	«Космос-1438»	88,9	254	213	70,4
8 февраля	«Космос-1439»	89,7	371	180	70,4
10 февраля 9	«Космос-1440»	89,3	293	223	82,3
16 февраля	«Космос-1441»	97,5	667	632	81
25 февраля 9	«Космос-1442»	89,6	364	180	67,2
2 марта	«Космос-1443»	88,9	269	199	51,6
2 марта 10	«Космос-1444»	90,3	413	203	72,9
11 марта 10 (21)	«Молния-3»	12,25 ч	40 773 (34) в Северном полушарии	474 (35) в Южном полушарии	62,8
12 марта	«Экран» (22)	23,8 ч	35 619	35 619	0,1
16 марта	«Космос-1445»	—	—	—	—
16 марта 10	«Космос-1446» (20)	90,3	368	237	70
16 марта 10	«Молния-1» (21)	12,28 ч	40 821 (34) в Северном полушарии	488 (35) в Южном полушарии	62,8
23 марта 10	«Астрон» (23)	98 ч	200 000	2000	51,5
24 марта	«Космос-1447»	104,9	1025	975	83
30 марта 10	«Космос-1448»	104,9	1017	977	83
31 марта	«Космос-1449» (20)	90,3	402	207	72,9
2 апреля 11	«Молния-1» (21)	11,67 ч	39 023 (34) в Северном полушарии	483 (35) в Южном полушарии	62,9
6 апреля	«Космос-1450»	94,7	515	474	65,9
8 апреля 11	«Космос-1451» (20)	88,7	264	194	82,3
8 апреля 11	«Радуга» (24)	24 ч	35 870	35 870	1,3
12 апреля	«Космос-1452»	100,8	826	786	74
19 апреля 11	«Космос-1453» (20)	94,5	520	473	74
20 апреля 11	«Союз Т-8» (25)				

Function of Spacecraft

Kosmos is the designation of a series of satellites regularly (beginning on 16 March 1962) launched in the Soviet Union, carried into orbit by various boosters from several space launch centers, to investigate space and the upper layers of the atmosphere. The scientific program specifies study of the concentration of charged particles, corpuscular streams, propagation of radio waves, the Earth's radiation belt, solar radiation, meteoroid matter, cloud systems in the Earth's atmosphere, as well as testing and modification of many spacecraft components.

The Kosmos 1429 through Kosmos 1436 satellites were launched into orbit by a single booster.

Kosmos 1443 -- a multipurpose spacecraft-satellite (freighter and

1 Дата запуска	2 Название аппарата	3 Начальный период обращения, мин	4 Высота орбиты: 5 в апогее, км	6 в перигее, км	7 Наклонение орбиты, град
22 апреля 11	20 «Космос-1454»	89,7	374	181	67,2
23 апреля	«Космос-1455»	97,8	676	648	82,5
25 апреля	«Космос-1456»	11,82 ч	39 343	613	62,8
26 апреля	«Космос-1457»	89,8	376	180	70,4
28 апреля 11	«Космос-1458»	89,1	275	220	82,3
6 мая	«Космос-1459»	104,8	1028	960	83
6 мая 12	«Космос-1460»	90,1	369	218	70,3
7 мая	«Космос-1461»	93,3	457	438	65
17 мая	20 «Космос-1462»	89,5	318	224	82,3
19 мая	«Космос-1463»	103,5	1570	307	82,9
24 мая 12	«Космос-1464»	104,9	1022	985	82,9
26 мая	«Космос-1465»	93,4	551	349	50,7
26 мая	«Космос-1466»	89,7	367	180	64,9
31 мая	«Космос-1467»	90	389	209	72,9
2 июня 13	26 «Венера-15»				
7 июня 13	20 «Космос-1468»	89,3	283	227	82,3
7 июня 13	26 «Венера-16»				
14 июня 13	20 «Космос-1469»	90	377	211	72,8
23 июня 13	20 «Космос-1470»	97,8	680	645	82,5
27 июня 13	25 «Союз Т-9»				
28 июня 13	20 «Космос-1471»	89,7	369	182	67,2
1 июля 14	27 «Прогноз-9»	26,7 сут.	720 000	380	65,5
1 июля 14	28 «Горизонт»	24,65 ч	36 600	36 600	1,3
5 июля	20 «Космос-1472»	88,8	264	197	82,4
6 июля	«Космос-1473» —	115,1	1511	1448	74
14	«Космос-1480»				
8 июля	«Космос-1481»	11,97 ч	40 165	615	62,8
13 июля	«Космос-1482»	90,2	376	217	70
19 июля 14	21 «Молния-1»	11,67 ч	39 025 34 в Северном полушарии	480 35 в Южном полушарии	62,9
20 июля	20 «Космос-1483»	89,5	305	227	82,3
24 июля	«Космос-1484»	97,3	673	595	98
26 июля	«Космос-1485»	90,2	395	209	72,9
3 августа	20 «Космос-1486»	100,8	820	786	74,1
5 августа 15	«Космос-1487»	89,5	305	226	82,3
9 августа	«Космос-1488»	90,2	397	208	72,8
10 августа	20 «Космос-1489»	89,3	323	182	64,7
10 августа 15	«Космос-1490» —	11,27 ч	19 154	19 154	64,7
	«Космос-1492»				
17 августа	29 «Прогресс-17»	88,7	257	196	51,6
23 августа	20 «Космос-1493»	90,2	396	207	72,9
26 августа 15	24 «Радуга»	24,63 ч	36 617	36 617	1,3
31 августа 15	21 «Молния-3»	12,27 ч	40 815 34 в Северном полушарии	497 35 в Южном полушарии	62,8
31 августа 15	20 «Космос-1494»	93,5	561	341	50,7
3 сентября 16	«Космос-1495»	88,9	248	211	82,3
7 сентября	«Космос-1496»	89,6	362	182	67,2
9 сентября 16	«Космос-1497»	90,3	403	208	72,8
14 сентября	«Космос-1498»	89,4	305	222	82,3
17 сентября 16	«Космос-1499»	90,2	396	208	72,9
28 сентября	«Космос-1500»	97,8	679	649	82,6
29 сентября 16	22 «Экран»	23,8 ч	36 630	36 630	0,4

interorbital tug). Consists of an orbital unit and payload-return craft. Its total mass in orbit with payload exceeds 20 tons, length more than 13 m. Diameter at widest point exceeds 4 m, solar panel spread 16 m. The reentry vehicle is equipped with retrorockets and systems providing autonomous flight, controlled descent and soft landing capability. It is designed to return 500 kg of payload to the Earth. On 10 March 1983 Kosmos 1443 docked with the Salyut 7 scientific station. The spacecraft separated from the station on 14 August. In the course of the craft's subsequent autonomous flight, the reentry vehicle was separated from it, delivering to the Earth materials from research performed on board the station by cosmonauts Lyakhov and Aleksandrov. The spacecraft-satellite's flight came to an end on 19 September.

Molniya 3 is a communications satellite used in the long-distance telegraphic-telephonic radio communications system, for transmission of USSR Central Television programming to locations in the Orbita network, and for international cooperation. The satellite carries relay equipment operating in the centimeter band.

Ekran is a TV broadcasting satellite carrying relay equipment, operating in the decimeter band, providing 1

30 сентября[16]	[20]«Космос-1501»	94,4	516	470	82,9
5 октября[17]	«Космос-1502»	92,2	411	372	75,9
12 октября	«Космос-1503»	100,9	827	791	74
14 октября	«Космос-1504»	89,3	328	180	64,9
20 октября[17]	[29]«Прогресс-18»	88,8	269	193	51,6
20 октября[17]	[30]«Вертикаль-11»				
21 октября[17]	[20]«Космос-1505»	80	377	210	72,9
26 октября	«Космос-1506»	104,8	1026	969	83
28 октября	[31]«Метеор-2»	101	901	780	81,2
29 октября	[20]«Космос-1507»	93,02	449	431	65
11 ноября[18]	[20]«Космос-1508»	108,8	1964	400	83
17 ноября	«Космос-1509»	89,3	309	209	72,9
23 ноября[18]	[21]«Молния-1»	11,7 ч	39 150[34] в Северном полушарии	465[35] в Южном полушарии	62,8
24 ноября[18]	«Космос-1510»	116,1	1537	1497	73,6
30 ноября	[20]«Космос-1511»	89,7	368	181	67,2
30 ноября[18]	[28]«Горизонт»	23,99 ч	35 850	35 850	1,4
7 декабря[19]	«Космос-1512»	90,2	392	208	72,9
8 декабря	[20]«Космос-1513»	105	1029	977	83
14 декабря	«Космос-1514»	89,3	288	226	82,3
15 декабря	«Космос-1515»	97,8	676	648	82,5
21 декабря[19]	[21]«Молния-3»	12,27 ч	40 635[34] в Северном полушарии	645[35] в Южном полушарии	62,8
27 декабря[19]	«Космос-1516»	89,2	299	205	65
27 декабря	[20]«Космос-1517»				
28 декабря	«Космос-1518»	11,8 ч	39 345	614	62,8
29 декабря	«Космос-1519» — «Космос-1521»	11,23 ч	19 100	19 100	64,8

2 3 4,5,6 7 transmission of Central Television programming to a network of community receiving stations. Bears the international registration identification Statsionar-T. Employment of satellite communications systems provides television broadcasting to approximately 90 percent of the people in the Soviet Union. There are 90 space communications stations of the Orbita system operating in the USSR, more than 2,000 stations of the Ekran system, and approximately 100 Moskva TV receiving stations.

Molniya 1 is a communications satellite involved in the long-distance telephone-telegraph radio communications system, as well as transmission of USSR Central Television programming to points in the Orbita network located in the Far North, Siberia, Far East, and Central Asia. Subsequent modernization of the Molniya 1 type satellite led to the development of Molniya 2 and

Key:

1. Date of launch; 2. Spacecraft designation; 3. Initial period of revolution, minutes; 4. Altitude of orbit; 5. At apogee, km; 6. At perigee, km; 7. Orbital inclination, degrees; 8. January; 9. February; 10. March; 11. April; 12. May; 13. June; 14. July; 15. August; 16. September; 17. October; 18. November; 19. December; 20. Kosmos; 21. Molniya; 22. Ekran; 23. Astron; 24. Raduga; 25. Soyuz; 26. Venera; 27. Prognoz; 28. Gorizont; 29. Progress; 30. Vertikal'; 31. Meteor; 32. Hours; 33. Days; 34. In the Northern Hemisphere; 35. In the Southern Hemisphere

Molniya 3 satellites. These satellites, in particular, use a higher band of frequencies (4-6 megahertz), which makes it possible to increase severalfold the number of telephone-telegraph communication channels. This also made it possible to improve TV picture quality.

Astron is an automatic station for the conduct of astrophysical investigations of galactic and extragalactic sources of cosmic radiation. It carries an ultraviolet telescope and a set of X-ray spectrometers. French specialists took part in designing and building equipment for the ultraviolet telescope, in conformity with a Soviet-French program of cooperation in the exploration of space for peaceful purposes. In addition to scientific equipment, the station carries the following: an independent control system; a radio system for precise measurement of orbital parameters; a radiotelemetry system for transmitting scientific data to Earth.

Raduga is a communications stellite with on-board relay equipment to provide telephone-telegraph radio communications and for transmitting TV programming.

Soyuz T-8 -- manned spacecraft carrying spacecraft commander V. Titov, flight engineer G. Strekalov, and cosmonaut-scientist A. Serebrov. On 22 April the spacecraft's reentry vehicle landed in the target area of the Soviet Union 60 km northeast of the town of Arkalyk.

Venera 15 is an automatic interplanetary station for continuation of scientific investigation of the surface and atmosphere of the planet Venus, conducted from orbit.

Venera 16 is an automatic interplanetary station. It is similar in design and function to the Venera 15.

Soyuz T-9 -- a manned spacecraft carrying spacecraft commander Hero of the Soviet Union Col V. Lyakhov and flight engineer A. Aleksandrov. On 28 June the Soyuz T-9 docked with the Salyut 7-Kosmos 1443 orbital complex. The cosmonauts returned to earth on 23 November.

Prognoz 9 -- an automatic station to investigate residual radio-frequency emissions from the "Big Bang," X-ray and gamma bursts in deep space, as well as solar corpuscular and electromagnetic radiation, plasma fluxes and magnetic fields in near-earth space, to determine the influence of solar activity on the interplanetary medium and the Earth's magnetosphere.

Gorizont -- communications satellite. Launched as part of the program of further development of satellite communications systems and TV broadcasting.

The Kosmos 1490-Kosmos 1492 satellites were launched into orbit by a single booster.

Progress 17 -- automatic freighter. Purpose of launch -- delivery of consumables and various cargo to the orbital station. On 19 August it docked with the Salyut 7 - Soyuz T-9 orbital complex. On 17 September the craft separated from the station. The mission ended on 18 September.

Progress 18 -- an automatic freighter. Purpose of the mission -- to deliver consumables and various cargo to the orbital station. On 22 October it docked with the Salyut 7-Soyuz T-9 orbital complex. The craft separated from the station on 13 November. The flight ended on 16 November.

The Kosmos 1473-Kosmos 1480 satellites were launched into orbit by a single booster.

Vertikal'-11 -- geophysical rocket. Boosted to an altitude of approximately 500 km. Purpose of launch -- continuation of combined investigations of shortwave solar radiation. On the descending part of its trajectory, at an altitude of 95 km, a recoverable capsule separated from the astrophysical sounding rocket. The capsule, carrying scientific equipment and measurement results, parachuted to a landing.

Meteor 2 -- weather stellite. Carried on board: equipment for obtaining global imagery of cloud cover and the underlying surface in the visible and infrared regions of the spectrum, both with stored and real-time transmission, as well as radiometric instrumentation for continuous observation of penetrating radiation fluxes in near-earth space.

Kosmos 1514 -- satellite designed to continue investigating the effect on living organisms of factors involved in space flight. All creatures (small laboratory animals, fish, and two monkeys -- Abrek and Bion) endured weightlessness well and on 20 December were taken to Moscow from the landing site, to the USSR Ministry of Health Institute of Medical-Biological Problems.

The Kosmos 1519, Kosmos 1520, and Kosmos 1521 satellites were launched into orbit by a single booster.

These satellites were designed to test components and instrumentation of a satellite navigation system designed to determine the position of civil aircraft and vessels of the merchant and fishing fleets of the Soviet Union.

3024
CSO: 9144/347

END